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AUTOMOTIVE INDUSTRIES

VOLUME 55

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NUMBER 5

Conditions *in the* Dealer Field Better Today Than *a* Year Ago

Majority of retailers making more money than they made in 1925. Whether dealer is successful hinges largely on the factory's merchandising policies.

By Norman G. Shidle

EVERY year the automobile business becomes more stabilized. Every year success in making and selling motor cars depends more upon the efficiency in the regular, permanent methods of manufacture and marketing and less upon temporary spectacularism or spasmodic effort.

Consequently—

The effectiveness of orderly, continuous and stable marketing policies on the part of particular car factories becomes more evident each month as do the harmful effects of fluctuating, changeable and constantly varying methods on the part of others.

With the permanent success of every manufacturer bound up in the success of his dealers, the net profits of various dealer organizations offer a measuring stick of factory achievement worth serious consideration. Study of profits made this year by a representative group of dealers as compared with the first half of last year show three very interesting things:

1. A majority of car dealers are making greater net profits this year than they did last. Probably 60 per cent of all dealers are in this class.

2. A good sized group of dealers—about 36 per cent of the total—are making less money net this year than they did last. (The rest are going along at about the same pace as in 1925).

3. The number of dealers in a few important lines who have failed thus far to do as well as they did in 1925 brings down the average percentage of profit-making dealers materially. Reports from a representative group of dealers for four important lines, for example, show that 59 per cent are netting less than in 1925. In other words, the car handled by the dealer and the merchandising policies behind it, as well as the individual efficiency of the dealer himself, have an important bearing on the dealer success.

Much of the information on which these observations are based is the result of a survey just completed by *Automobile Trade Journal*. The investigation covered dealers for about twenty important makes of cars located in widely diversified sections of the country. Something like 200 replies were received. The figures procured, therefore, offer an interesting cross-section of dealer conditions, despite the fact that the returns are not large enough to warrant reliance on the detailed accuracy of the percentages compiled.

Easier Used Car Situation

Conditions in the dealer field are better today, both as regards the new and used car situation than they were a year ago, generally speaking, but the presence of severe difficulties in individual cases is not to be denied. And the important thing to be noted from a factory standpoint is that the profit-making possibilities of groups of dealers seem to vary quite directly in accordance with the stability, fairness and cooperative features of the factory merchandising plan. This fact seems to run through the replies with a pretty fair degree of uniformity even when a discount is granted because of the known inefficiency of certain numbers of retailers as individuals.

This survey would indicate that new car and used car sales have been running ahead of last year by just about the same proportion. Figures from the dealers reporting show an average increase in new car sales of 18.8 per cent over the first half of last year and an increase of 16.3 per cent in used car business.

New car stocks have been increased generally in accordance with the increased rate of sale. The dealers seem to have had on hand approximately 18

per cent more new vehicles on June 1, 1926, than they did on June first a year ago.

Used car stocks, on the other hand, seem to have been about the same at the end of the first half of this year as they were on June 1, 1925.

This doesn't mean that used car stocks are nothing to worry about, but it does indicate a relatively healthy condition for the trade as a whole. It shows that dealers on the average, by increased selling pressure and better handling of trade-ins, have been able to keep their used car stocks down to what they were a year ago.

Gain in New Car Sales

They have been able to handle 18 per cent more new cars without increasing used car stocks.

That is a clear indication of progress in the handling of the used car situation. No small part of the improvement in a number of lines is due to the strenuous efforts which have been made on the part of factory sales organizations to help their retailers move used vehicles more rapidly. Within the last twelve months, manufacturers have spent literally hundreds of thousands of dollars assisting dealers in various ways with their used car problems.

The results indicate that this money has been well spent; that it is returning practical benefits of a quite tangible character.

Then too the general educational work on used cars is beginning to have some recognizable effect on the operations of individual dealers, while the working out of local used car plans such as that of the Border Automotive Dealers Association also is probably influencing the situation to some extent.

But despite the alleviation of some of the worst phases of the used car situation, serious work still remains to be done. It is certain that dealers have to sell at least one used car for every new car they handle today, while some figures indicate that the proportion averages as high as 1.5 used cars per new car. That means that a lot of dealers are handling two and three used vehicles for every new one, a task of no meager proportions.

Many manufacturers this year were planning to shade off shipments to dealers so that the retailers'

stocks would reach a low point about June 1; others were aiming for July 1. With this thought in mind, it is interesting to note that the low point on June 1, 1926, apparently was something like 18 per cent higher than on June 1, 1925, as already mentioned.

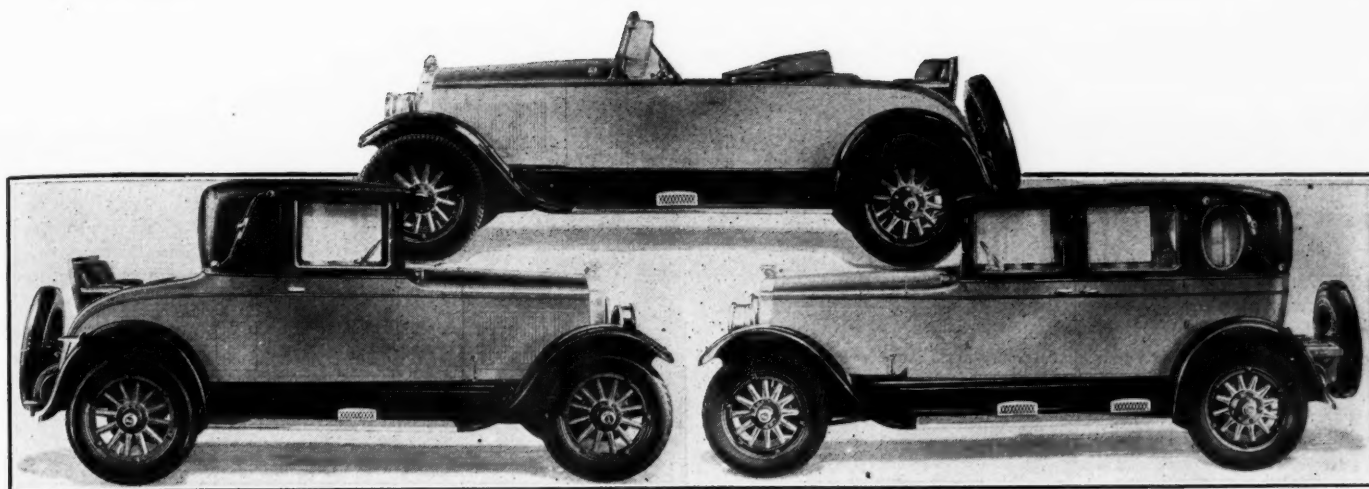
The condition of car stocks can be judged, of course, only in relation to expected future business, the rate of sale in past months being no true gage by which to judge current stock sizes. If stocks were 18 per cent higher on June 1 this year than on June 1 last, it might be taken as an indication that present prospects are for sales this year to continue to run ahead of last year's sales during the last six months by about the same margin as during the first six. This doesn't seem likely to happen, although so many prophecies have gone awry in recent months that prognosticating constantly takes on additional hazards.

Looking at the very heavy output which was recorded in several of the latter months of 1925, however, it doesn't seem likely that those same months this year will show an increase of 18 per cent over last. This being the case, it is reasonable to believe that stocks of new cars on June 1 were fairly high on the average. Further reductions in stocks of many lines took place during June and July, however, so that conditions today can be assumed to be reasonable and safe.

Throughout the competitive merchandising period which the industry is entering with the announcement of new models and the striving for maintenance of production rates, there seems sure to be an increase in the value of factory marketing policies which are permanent but not rigid, sound but not arbitrary, and flexible but not vacillating



The interests of the car manufacturer and the car dealer are interdependent. A good share of dealer success depends upon the constructiveness and stability of the factory sales policy



Above is the new Buick roadster model on the Master Six 128 in. chassis. Lower left—New de luxe coupe on the Standard Six chassis. Lower right—The rounded roof lines and rear panels of the new closed models are evident in this view of the Master Six 128 in. five-passenger brougham-sedan

Buick 1927 Line Has Counter-Balanced Crankshaft and New Transmission

Other mechanical additions include a crankcase ventilating system, rubber cushioned power plant and AC oil filter.

Color now used around windows of closed models.

By Leslie S. Gillette

A NUMBER of mechanical changes and body refinements have been made in the 1927 Buick line although the characteristic dimensions of the engines and chassis as well as the previous body lines of both the Standard Six and the Master Six cars are retained.

The new mechanical features include a counter-balanced crankshaft embodying a "torsion balancer," crankcase ventilating system, rubber cushioned power plant, new transmission and AC oil filter.

The closed bodies are now built with new roof lines and rear corner panels, and are finished in striking new color combinations with the color effect carried into the black upper structure by color inserts around all windows. The five-passenger open cars have folding tops which in their closed position set flush with the top of the rear seat. Rumble seats are provided now in both roadster models.

Although three entirely new closed body styles have been added to the line and four new open sport cars supersede the six previous open jobs, sixteen body models, the same number as listed in the 1926 line, are offered in the latest series.

All 128-in. models and the four open cars are of the deluxe type carrying special equipment including a new radiator emblem in the form of the winged head of a young maiden. The two-passenger coupes in addition to the roadsters have the new rumble seats.

The outstanding features of the new cars is the increased power which has been obtained without change in engine dimensions, and the practical elimination of engine vibration, noise and closed body rumble. It is

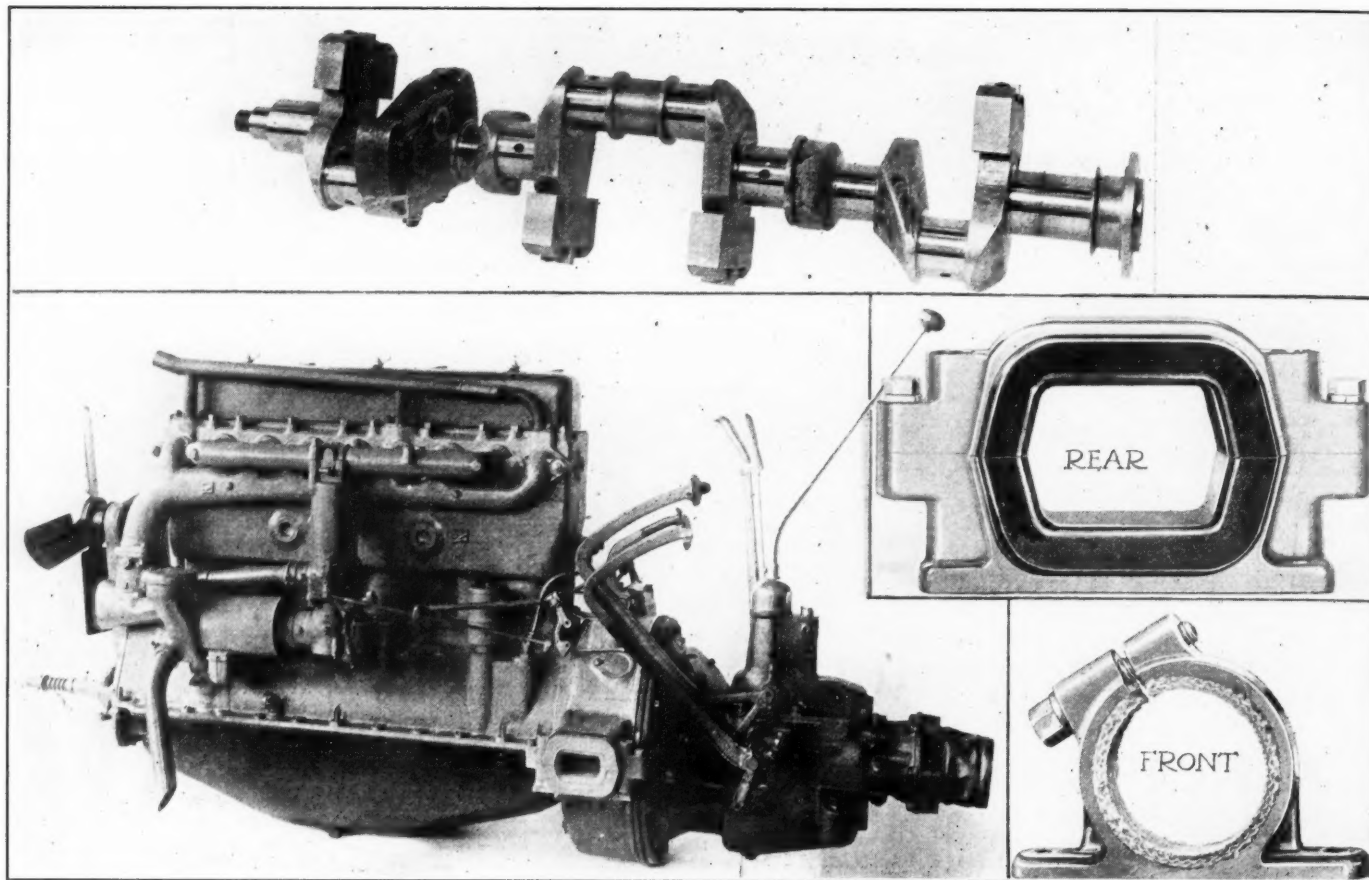
mainly to the combination of a "torsion balancer" and a counter weighted crankshaft, together with the rubber cushioned engine, that the improved performance is credited.

High Speed Torque Increased

By reducing friction on the bearings through the use of balance weights on the crankshaft and lighter pistons, the high speed engine horsepower and the high speed torque have been increased materially. The following table indicates how the power curve of the 1927 engines, compared with the previous engines, has been flattened out at the high speeds, thereby giving the increased horsepower at this range.

MASTER SIX		
Model	Horsepower	R. P. M.
1926	77	2800
1927	77	2800
1926	72	3200
1927	76	3200
STANDARD SIX		
1926	59½	2800
1927	62	2800
1926	55	3200
1927	62	3200

High main bearing pressures are reduced through the mounting of four separate counterweights on the crankshaft. These, secured to squared projecting surfaces on the shaft by two studs each, are attached opposite connecting rod bearings Nos. 1, 3, 4 and 6 respectively. The four-bearing style of crankshaft is retained in both engine models.



Above—The new counter-balanced crankshaft with the "torsion balancer" mounted on No. 2 cheek. In operation and principle, this unit is the same as the "harmonic balancer," first used on the Oakland

Lower left—Intake side of the new Buick powerplant

Right—Front and rear engine supports

Referred to by Buick as a "torsion balancer," the vibration dampening unit mounted on No. 2 crankshaft cheek is of the same general design and operates on the same principle as the "harmonic balancer" employed on two other makes of General Motors cars. The pivot pin bearing, however, is lubricated under pressure from the crankshaft oiling system while the tension applied to the balancing bar is through two sets of leaf springs. As a further step toward smoother operation, the weights of the pistons have been decreased and the weight of the flywheel increased. A total decrease of $2\frac{1}{4}$ lb. in the weight of the reciprocating mass of both engines is effected through lightening each piston by 6 oz. Pistons are of cast iron as in the past. On the Standard Six engines the weight of the flywheel is increased by 4 lb. but on the Master Six the increase is 38 lb. The great difference between the flywheel weights in the small and large engines is due to results obtained under tests, the small flywheel giving the best results in the Standard Six, while a heavier flywheel could be used to greater advantage in the Master Six. Comparing the two crankshafts, complete with counter weights and balancer but minus flywheels, with the shafts employed in 1926 models, the shaft on the new larger six is $25\frac{1}{2}$ lb. heavier, while the Standard Six shaft is $16\frac{1}{2}$ lb. heavier.

Still another factor in the quieter operation of the car is a new method of securing the powerplant to the chassis frame. In the new models there is no direct metallic contact between the engine and frame, the rear supports for the engine being cushioned by thick live rubber mountings with the front support provided with a rubber impregnated fabric lining. The front engine

support is not radically different from the previous mounting except that provision is made for inserting a strip of rubber impregnated fabric lining between the support and engine. At the rear, however, the ends of the supporting arms on the flywheel housing are surrounded by thick rubber blocks approximately $\frac{3}{4}$ in. thick which are retained in a cradle and cap. The cradle holding the rubber blocks is bolted to a forged angle plate which in turn is riveted to the chassis side rails.

Draining Crankcase

Through the combination of a crankcase ventilating system, cooling system thermostat and a new oil filter of AC make, the Buick Co. states it is necessary to drain the crankcase oil only four times a year. The ventilating system works on the ejector principle and tends to remove the water, acid and fuel fumes before they can condense into the crankcase. In this system, the oil filter unit plays an important part. Referring to the diagram, air is forced by the radiator fan through a funnel-shaped duct A into a passage formed in the oil filler casting. This passage, having direct connection with the interior of the oil filler casting, is provided with a baffle B which deflects the incoming air into an outlet passage without allowing the air to enter the oil filler throat. The movement of the air past the passage leading to the filler throat creates a suction in the latter which draws the crankcase vapors and fumes past the baffle B and into the outlet pipe where they are exhausted into the air at point C beneath the side dust pans of the engine. At the rear of the crankcase a breather, provided with close mesh screening to exclude

dust and foreign matter, allows air to enter the case, enabling the system to function properly. This arrangement also tends to prevent fumes from the engine entering the body.

The thermostat is mounted directly in the upper water tank at the point of the radiator hose connection and is set to close when the water temperature drops to 120 deg. The operation of the new AC oil filter was described in a recent issue in connection with the Oldsmobile changes and in brief consists of a rolled up filtering element formed of a flannel which unrolls as it absorbs the dirt in the oil and gradually exposes new sections of the filtering medium to the incoming oil. The cartridge is designed especially for quick and economical replacement.

Slight changes have been made also in the valve mechanism, manifolding and exhaust system. By redesigning the cams and valve springs, quieter operation throughout the entire speed range is obtained. The coils at the

housings have been materially reinforced. All high and intermediate transmission gear teeth have been changed from 20 deg. stud involute 7-0 pitch to 20 deg. full-depth involute tooth of 7 pitch. At the same time all gears have been increased in face width by from 1/16 in. to 3/32 in. The larger gears reduce pressure on the teeth while the new tooth forms give a smoother rolling action and reduce gear chatter. Instead of having the largest gear riveted to the remainder of the cluster, the countershaft gears are now forged in one piece, adding strength besides making for quieter operation.

With the rear engine supports mounted in rubber, this part of the powerplant no longer acts as a frame member between the side chassis rails. In order to strengthen the chassis at this point a U-shaped steel cross member passing under the clutch housing has been added. Due to the higher speeds at which the cars are likely to be driven, the steering and third arms on the front axles have been made larger while the steering knuckles are formed of alloy steel to provide an additional margin of safety. All four wheels are provided with a counter weight placed in the felloe to balance the effects of the tire valve thus reducing the tendency of the wheels to bounce at high speeds.

New Color Scheme

In the bodies, the greatest change is the new scheme of coloring. Better harmony in the color schemes has been imparted by adopting jet black tires mounted on black finished rims. Previously, white sided tires on bright finished rims were employed. The color inserts around the closed body windows is a new vogue in quantity production cars.

All closed cars are upholstered with a special mohair with broadcloth optional in certain models. All closed models also have a new type of sun visor, improved cushion and back springs, new foot rests and carpets, and walnut garnish mouldings.

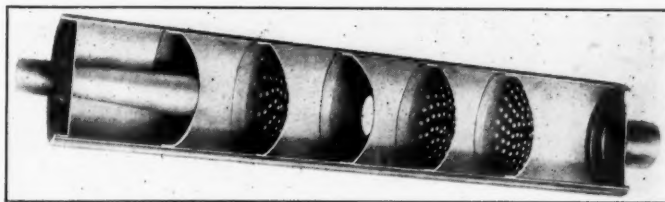
The open cars are covered with genuine Spanish leather. Curtains having large pyralin lights 1/32 in. thick for the open models are carried in a special compartment behind the seat in the roadster models and behind the rear seat in the five-passenger cars. The rear decks of the roadsters are higher and better streamlined, which allows more room for the rumble seats and permits the use of a small door. The tan folding tops of both sport models are provided with natural wood bows and nickel-plated sockets while the arm rests in the folding seats are nickled also. The windshields are of the

Prices on the Buick Standard and Master Six lines for 1927 follow:

	Standard Six	Old	New
Two-pass. coupe		1195	1195
Five-pass. two-door sedan		1195	1195
Five-pass. four-door sedan		1295	1295
Four-pass. coupe		1275	1275
Four-pass. sport roadster		new	1195
Five-pass. sport touring		new	1225
Four-pass. country club coupe		new	1275
Master Six			
120 in. wheelbase			
Five-pass. two-door sedan		1395	1395
Five-pass. four-door sedan		1495	1495
Four-pass. coupe		new	1465
128 in. wheelbase			
Four-pass. sport roadster		1495	1495
Five-pass. sport touring		1525	1525
Country club coupe		1765	1765
Seven-pass. sedan		1995	1995
Five-pass. brougham sedan		1925	1925
Five-pass. coupe		new	1850

lower ends of the springs have been spaced farther apart to give better cushioning and reduce possibility of breakage. By increasing the angle of cam movement in taking up the .008 in. valve lash from 20 deg. to 50 deg. this larger angle tends to pick up the lash and set it down again with a sliding effect rather than by an abrupt movement. Extra studs have been added to clamp both sides of each port on the exhaust manifold to prevent any distortion, or blowing of gaskets. The joints and connections in the exhaust piping system have been improved to prevent leakage. The muffler also is of new type, being formed of a large number of baffles welded directly to the outer shell to reduce noise, while the tail pipe is now longer and extends completely clear of the chassis at the rear. As another means of checking possible noise from the exhaust system, the connection to the closed car heater is through a double valve connection which allows the required amount of exhaust gas to enter the heater and return before finally passing into the muffler.

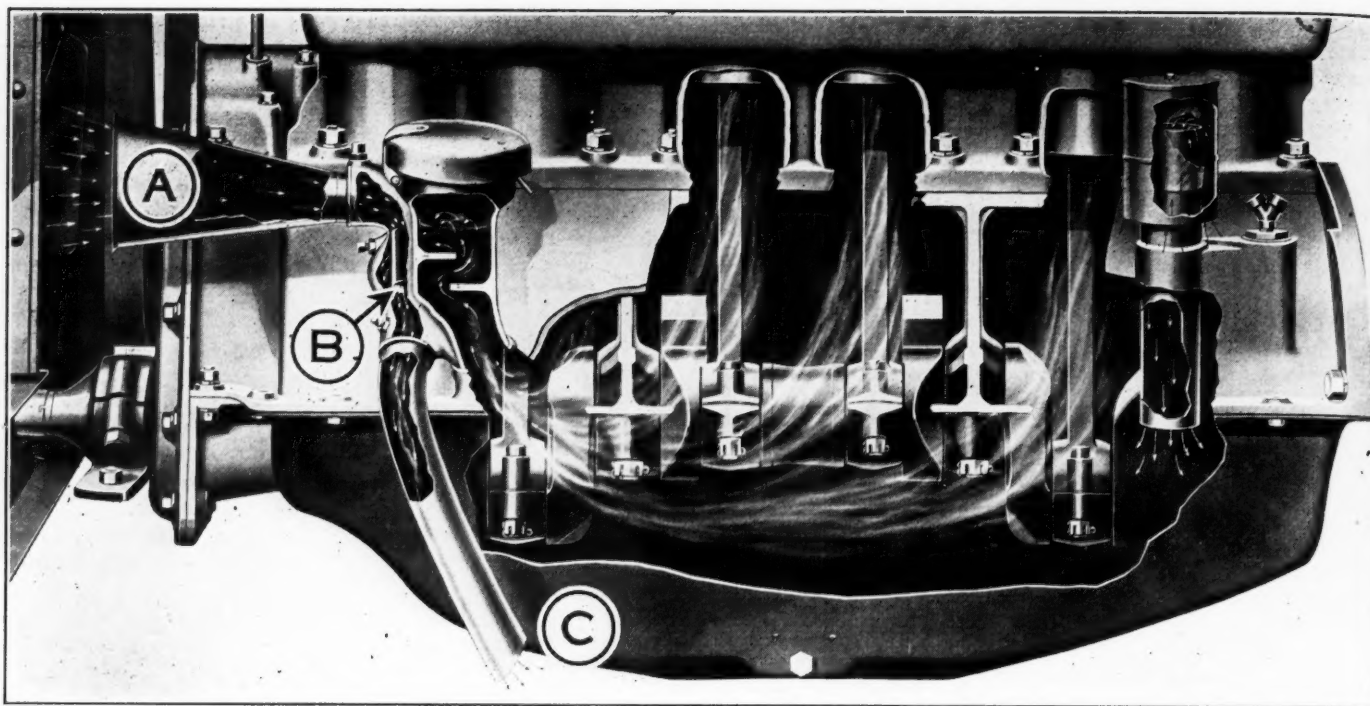
In addition to an entirely new transmission employed on both chassis, changes have been made in the flywheel and bell housing to reduce gear noises and strengthen certain parts. To insure positive alignment under all conditions, a large and positive pilot is employed between the engine and transmission. In addition to the usual bolts a recess formed in the face of the flywheel housing encircles the bell housing and serves to maintain clutch alignment by providing a more rigid joint. Both



The improved Buick muffler. Baffles are now welded directly to the outside shell

one piece type and two inches lower than the previous models.

The three new closed models in the line are a deluxe two-passenger coupe with rumble seat on the Standard Six chassis, a four-passenger coupe on the Master Six 120-in. chassis and a five-passenger coupe on the 128 in. Master Six chassis. The compartment behind the driver's seat in the conventional 4-5 passenger coupe has been eliminated and the rear seat has been extended all the way across, giving ample room for five passengers in the 128 in. coupe.



Phantom view showing operation of Buick crankcase ventilating system

Changes have been made in the instrument board to improve its appearance and a new system of indirect lighting installed. A push button above the ignition switch controls the instrument lights, which shine through and illuminate the separate figure combinations in each dial. At the same time the system incorporates another feature which allows a shaft of light to be con-

centrated upon the transmission lock when the instruments are illuminated. The models carrying the new radiator emblem have a dash heat-indicator mounted in the same group with the gasoline gage, ammeter and oil gage. Standard equipment on all models includes automatic windshield cleaner, rear view mirror, cowl lights and stop light.

Heat Treatment of Chromium Magnet Steels

ACCORDING to an article by Messrs. Schulz and Fenge in *Stahl und Eisen*, chromium magnet steels are much more sensitive than tungsten magnet steels to slight variations in the heat treatment. Table I herewith shows the variations in the coercive force H_c and of the remanence B_r as a function of the time during which the steel is maintained at the hardening temperature, for a steel with 1 per cent carbon and 2 per cent chromium.

Table I—Magnetic Characteristics.

Time in mins. steel is maintained at 1475 deg. F.	B_r	H_c	$B_r H_c \times 10^{-3}$
2	10,700	39.1	420
5	10,800	58.5	632
10	10,500	63.0	681
15	10,000	62.0	625
20	9,800	58.2	570

The increase of H_c with the time during which the steel is kept at the hardening temperature is due to a more complete solution of the carbides, with the result that after hardening a greater proportion of carbon will be in solution in the α iron. It will be noted that after a certain number of minutes the magnetic qualities are lowered. The authors attribute this to a coarsening of the grain, which prevents the r_a transformation during cooling from being complete. They thus admit that keeping the steel at the hardening temperature for a longer time makes the solution more homogeneous and diminishes the number of carburized centers which may serve as nuclei of the transformation. One thing they do not men-

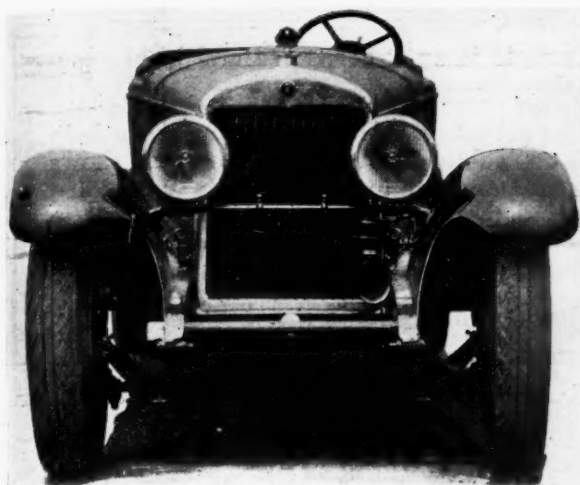
tion is whether the test pieces after 30 minutes at the hardening temperature showed any surface decarburization, which is a frequent cause of loss of magnetic properties.

The optimum time is determined by trial and error. If both B_r and H_c are low, the steel is kept at the high temperature too long, if B_r is too high with relation to H_c , the steel remained at the high temperature for too short a time. The electrical conductivity, moreover, varies in the same sense as B_r . It was also found that—

1. For one and the same steel this time is the shorter the higher the hardening temperature, which temperature, moreover, cannot be raised materially without increasing the proportion of austenite, which is detrimental to the magnetic properties.

2. That these properties are better the more finely divided the carbon before hardening.

The authors summarize the phenomena observed by them as follows: At the same time that the carbon begins to pass into solution after passage of the A_c point, the grain begins to grow and the carbon to diffuse. In order that these factors may be as slight as possible, it is necessary that the carbon be finely divided, so that it can dissolve rapidly at the lowest temperature. To this end all unnecessary annealing during the fabrication of the magnets should be avoided, as such annealing precipitates the carbides in large grains, to the detriment of the magnetic qualities of the steel as well as its tensile strength.



Left—Front view of Cadillac with the new radiator design. The fenders are now one-piece stampings. Above—Seven-passenger "standard" Cadillac sedan giving side view of new fenders. The battery and tool boxes are now carried in compartments in the dust shields below the front doors

Fifty Models Now in Cadillac Line

Five new ones just added. Public also offered 500 color and upholstery combinations. Chassis refinements made.
New push and pull type ignition switch used.

BESIDES adding five new body models to the regular "custom" and "standard" lines, Cadillac Motor Car Co. has announced several refinements in the chassis, including new style fenders, the removal of battery and tool boxes to concealed compartments in the side dust shields, improvements in the springs and a new radiator design and has changed prices on its entire line.

The company is also placing greater stress than ever before on individuality in design by offering of 50 body models in 500 color and upholstery combinations with an extensive choice of appointments.

Including the five new models, eighteen bodies built by Fisher and comprising the present "standard" and "custom" lines will be in regular production. The remaining 32 body styles completing the line of 50 bodies will be supplied by outside body manufacturers. Four of the "special custom" bodies will be supplied by Brunn, eighteen by Fleetwood, and the remaining 10 by other custom body builders. The range of the 500 color combination will be available on each of the three groups of body models.

The five new body models are: Five passenger sport landau sedan and custom two passenger convertible coupe, both on 132 in. wheelbase chassis; Imperial sedan, seven passenger, on 138 in. chassis, sport phaeton with tonneau windshield and five-passenger Victoria coupe.

Formerly the front fenders, while of the full crowned type, were built up of three pieces. On the new models they are one piece stampings which imparts smoother lines and gives additional strength. The rear fenders remain unchanged.

* See page 191 for complete list of Cadillac prices.

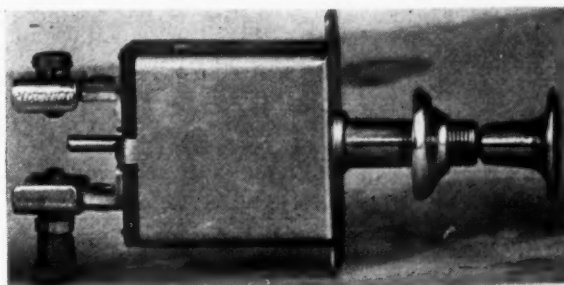
To create the appearance of greater size and increased strength, the shape of the radiator shell has been changed. The front radius has been reduced to give a sharper effect while at the point where the side and top surfaces of the shell meet the front surface, the edge has been brought nearly square. The illustrations at the top of this page show what the new design looks like.

A new type and make of oil filter, an AC, No. 2, supersedes the model previously employed. The rear springs have been given $\frac{1}{2}$ in. more camber and the spring bumpers have been reduced in height by a $\frac{1}{2}$ in. also, which give the springs one inch additional movement.

High tension springs in the ends of the steering cross rod are adopted now to take up wear and keep a definite tension automatically.

A new distributor of the air gap spark type and embodying a new ignition coil is used on the new series cars. The combination of the distributor and the new coil makes possible a slightly higher voltage together with a fatter spark. Other changes in the distributor include "plug-in" terminals instead of the screw-in type bushings, the use of a heavier secondary wire of 7 mm. throughout, and the employment of a 28 deg. cam. The distributor metal head cover has been eliminated in the latest series cars and its place is taken by special rubber nipples which exclude the entry of water where the ignition wires enter the distributor head.

A new push and pull type of ignition switch is mounted on the instrument board. No lock is provided in the ignition system, the only thief-proof device provided being the lock on the transmission.



New push-and-pull type ignition switch which is mounted on the Cadillac instrument board. No ignition lock is provided as there is a lock on the transmission



THE author of this article is an experienced and highly successful automobile show manager.

In concise manner he tells how car manufacturers can help their dealers to keep up public interest in the local shows which are held yearly throughout the country. He urges that the factory staff give some thought to the local shows well in advance and then pass on the results of their thinking to dealers for application in the local exhibits made by the latter.

It isn't too early to begin thinking about the shows *NOW*.

Live Show Exhibits Draw the Crowds

Manufacturers can add greatly to merchandising value of car displays by showing the public something novel.

By Herbert Buckman

Manager, Cleveland Automobile Manufacturers and Dealers Association

PAID attendance at the automobile shows last winter increased 15 per cent. The interest of the general public in these expositions of our industry is apparently inexhaustible. What a wonderful thing for the automobile business! How it is envied by other lines of trade!

And yet the surface is hardly scratched; the possibilities of increasing interest in the exhibits are enormous.

For many years we have stood our cars around the various halls and had some accessory displays in motion and the public has flocked in and, fortunately, liked it. The car exhibit with some special feature—even a chassis in operation—has been the exception rather than the rule. If we will begin to give some thought to building a greater degree of live interest into the individual exhibits the results in public response will—on the basis of past examples—be phenomenal.

Ample proof is afforded in the experience of those exhibitors who have sincerely endeavored to incorporate living interest in their displays. In other words, there should be some additional effort on the simple process of cashing in on the continued, tremendous popularity of the shows.

There is the case of one of the biggest manufacturers who year after year has made some special feature available to his distributors for show use. Their exhibits each year are crowded, and from personal knowledge the weeks following the show have been abundant with orders and the follow-up of show interest.

A striking contrast in this respect was offered in the shows of last winter. The exhibit of one line at an important show was remarkable for its sombreness. The cars were all black or so nearly so as to seem of that hue. In spite of the fact that this line had enjoyed extraordi-

nary success during the year preceding, its show exhibit was almost empty of spectators and looked uninviting. Just around the corner was the display of the manufacturer who made a practice of cashing in on the shows. There was a chassis lecturer, certainly nothing especially novel to a crowd of motor tradesmen. The writer of these lines visited the show in the morning, and there were scores of automobile men to whom a chassis was an old story crowded around the lecturer, interested and following through.

The sequel is extremely interesting. A big distributor of the all-black line went back to his home town and for his display in that city ordered a brilliant red roadster and a tan coupe. The result was just what might be expected. His exhibit was as well patronized as the factory's had been deserted. And six months later that factory came out with colored cars in the line!

That is just the example of the effect of working color into our car exhibits.

But color is only one way of increasing interest.

In the multitudinous contacts of the motor car with modern life there are further untold possibilities. The public interest awaits the slightest spark. There are hundreds of things about a motor car and its handling that properly displayed would hold the attention of the hundreds of thousands that pay to see our shows. Surely by giving the matter some forethought, car manufacturers could make available to their distributors (as well as for their own use in the national shows) display features of a special nature. The public is so eager for information, for any peg on which to hang its interest, that it borders on folly not to avail ourselves of this willingness.

It is time for exhibitors to get away from the deadly uniformity which has so characterized our shows and go

in for exhibits of individual development, to repay the people for their constantly increasing interest and to develop it still further.

Polished cut-out chassis, parts boards, bright colors and even moving signs have done their part. That they are good is proved by the interest aroused by them year after year. There are innumerable possibilities among variations of those favorites, to say nothing of new features that may be brought through engineering or promotion departments. Distributors would be eager for such features to enliven their exhibits, and a few duplicates could be routed through the show season expeditiously, economically and profitably. The chief requirement is a little forethought—a little preparation ahead of the actual ar-

rival of show time—an appreciation of the tremendous possibilities of putting across a story to eagerly interested throngs.

Let it be borne in mind that the hundreds of thousands of paid spectators at our annual shows present the opportunity to place before them, not a picture of our goods, not a catalog of it, not a talk about it—but the product itself.

Actual experience of those car and accessory manufacturers who have done work along this line in former years shows the amazing and valuable results following the exercise of some ingenuity, forethought and preparation in taking advantage of a phenomenal merchandising opportunity.

Causan Two-Cycle, Double-Piston Engine

PROMINENT among the two-cycle engines now being produced as experimental models by various European engineers is the Echegoin-Causan 91½ cu. in. model which took part in the recent motorboat race for the Duke of York's Cup, in England.

The Causan engine is of the two-crankshaft, double-piston, deflectorless type, and is believed to be similar, so far as its general features are concerned, to the racing models being experimented with by the Fiat Co. Weighing 200 lb. complete, it has four cylinders in a single iron casting weighing 50 lb., mounted horizontally, with an aluminum crankcase bolted to each end. Each cylinder receives a pair of opposed pistons, which are connected up, respectively, to a left and a right hand crankshaft, having throws at 90 deg., considered spirally, and carried in three plain bearings. Each of the crankshafts carries a spur pinion and the two are united by an intermediate pinion, which for boat service gave a 3.2 reduction.

Roots Compressor

The pistons on one of the crankshafts uncover the intake ports, while those on the opposite shaft uncover the six exhaust ports around each cylinder barrel. To allow of the complete evacuation of the spent gases, the exhaust crankshaft has a lead of 12 deg. over the inlet shaft. A Roots compressor, driven at engine speed off the intermediate pinion uniting the two crankshafts, delivers the mixture under pressure to the cylinders, and the charge

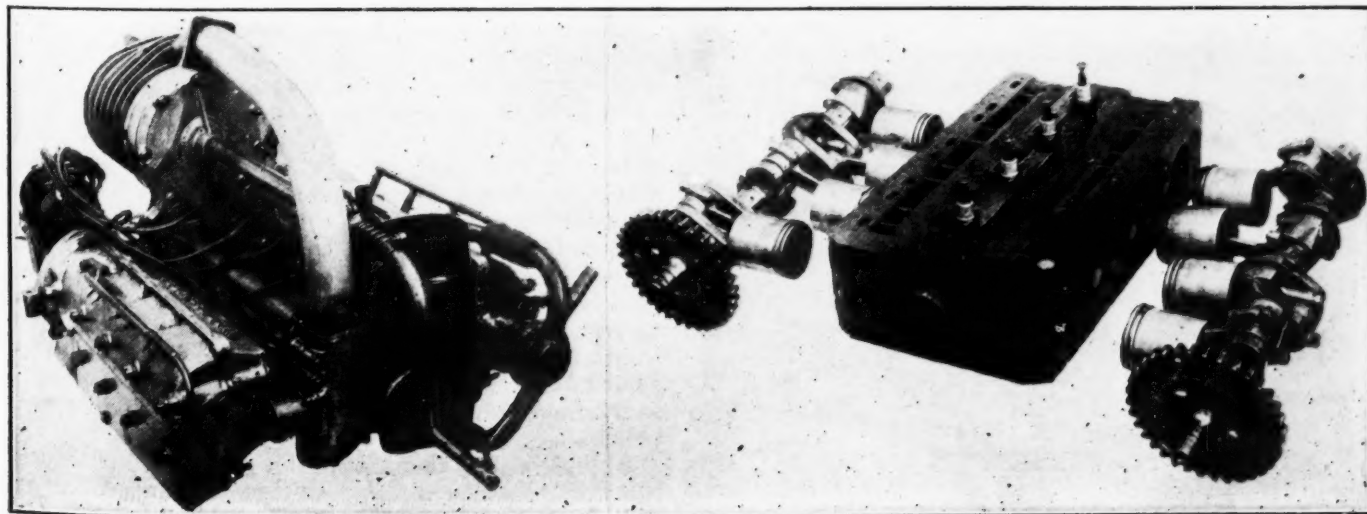
is fired by plugs mounted vertically and supplied with current from a magneto driven off the extremity of one of the crankshafts.

While the crankcase on the exhaust side is open to atmospheric pressure, that on the intake side of the engine is under the same pressure as the intake manifold and has lubricating features which are the subject of patents. The water pump is driven off the rear end of one of the crankshafts and cranking is through the blower.

Before it was put into the racing boat, the Causan engine underwent bench tests, when it developed 123 hp. at 3775 r.p.m. and 136.5 hp. at 4400 r.p.m. It is claimed that 150 hp. can be obtained. By reason of the unsuitable propeller size and the lines of the boat, it was very difficult to hold the craft, and eventually it capsized. Good results were obtained from the engine, however.

Plans have been laid for the production of an eight-cylinder box-type sixteen piston aviation engine on the same general principle as the four-cylinder model. The four crankshafts, with two throws at 180 deg., are connected up to a central pinion on the propeller shaft, and with a bore and stroke of 4.1 by 4.3 in., giving a piston displacement of 924 cu. in., it is claimed that 700 hp. will be developed at 2400 r.p.m., with a weight of 1.1 lb. p. hp.

ELECTRIC ignition of gaseous mixtures dates back to 1777 when Volta, the Italian scientist for whom the volt is named, discovered that a mixture of hydrogen and air could be ignited by an electric spark.



Causan two-stroke double piston engine

Cylinder block and crank trains of Causan engine

Dual Steering Gear Designed to Cure Wheel "Shimmy"

Each wheel is controlled separately in system developed by French engineer. Claimed to eliminate transverse oscillations of the radiator and hood.

By W. F. Bradley

A RADICAL cure of wheel shimmy is said to be effected by the use of a duplicate steering gear produced by Engineer Waseige of the Farman Automobile Co. of France. As the result of three years' study and experiment, Waseige concluded that shimmy, which he describes as a transverse vibration of the whole forward portion of the suspended mass of the car, with displacements of the center of gravity causing variations in the load on the left and right hand front springs which may be as high as 1750 lb., according to the Michelin experiments, must be considered as distinct from wheel wobble.

The Farman experiments showed that wheel wobble is the precursor of shimmy but does not always provoke it. Proof of this is to be found in certain cars which for twenty years have been afflicted with wheel wobble, which never, however, developed into shimmy.

The conclusion arrived at was that wheel wobble in itself is not dangerous and only develops into shimmy when the transverse pendulous movements of the two wheels are synchronized. As a proof of this, Waseige suggests that a car liable to violent shimmy be fitted with both left and right hand steering, the two columns being united by means of a bicycle chain, and the ordinary transverse tie rod abolished. If there is play in the connections, or if the steering gear is not sufficiently irreversible, the two wheels may wobble in a horizontal plane around their pivot, but as there is no synchronization, there will be no shimmy. This was clearly shown in moving pictures of experimental cars on the road.

With his special type of steering gear, Waseige controls each wheel separately. At the lower end of the steering column, a bevel pinion is in engagement with a corresponding pinion mounted on a transverse shaft carried in bearings on the chassis frame members. At each end of this shaft there are two universal joints and a telescoping shaft to allow for complete vertical and transverse movement of the front axle. Mounted on each end of the axle is a screw and nut, the screw being rotated by means of

the bevel gearing and the transverse shaft just described, and the linear movement of the nut causing a rotation of the steering knuckle by means of a short lever keyed on the knuckle and carried in the screw (Fig. 1). By mounting the two levers out of parallel it is possible to obtain the differences of angle between the outer and inner wheel in a turn, the problem indeed being the same as that involved in laying out the two steering arms united by the transverse tie rod.

There are several variations of this double steering. Instead of a screw and nut lever, a screw-nut and sector can

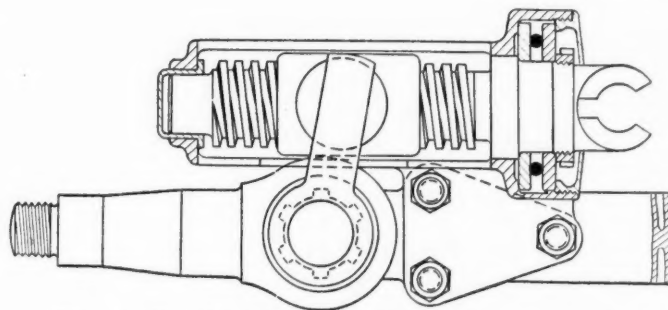


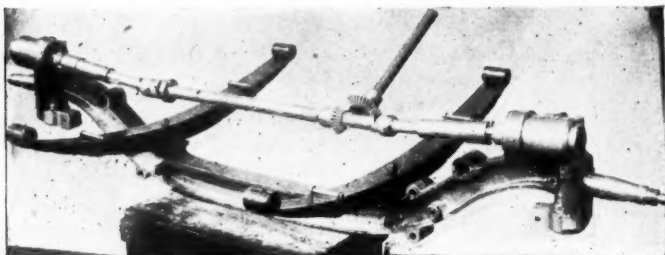
Fig. 1. Waseige duplicate steering gear—screw, nut and lever

be employed (Fig. 2), thus diminishing the overall dimensions and with the same degree of irreversibility, permitting a lower ratio between the steering wheel and the transverse shaft.

Another variant consists of a steering gear on each end of the axle with a Hindley worm (Fig. 3), A turning a disk B forming a part of the steering knuckle and carried between two thrust bearings. The machining of this is rather difficult, for owing to the difference in angle between the outer and inner wheel a differential pitch is necessary. When tooled up, however, this is the cheapest of the three systems.

Each front wheel being positively steered, there is no necessity for a transverse tie rod. It is maintained, however, on the Farman car, with a very considerable amount of play so that oscillations of either wheel will not be transmitted to the opposite wheel. This gives additional security in the case of breakage of one of the steering gears, for in such a case the car is controlled through the remaining gear and the transverse tie rod.

Waseige claims that this double steering gear remedies the worst possible cases of shimmy. In presenting this invention to a body of French automobile engineers, moving pictures were shown of a car on which an extreme



Waseige duplicate steering gear fitted to axle

degree of shimmy had intentionally been provoked, and the same car was filmed in motion with the duplicate steering gear, all other parts being unchanged, without any shimmy.

When projected at slow speed, these pictures showed that the front wheel alternately moved from left to right, the impression being that the driver was intentionally swinging the steering wheel over from side to side. By reason of these movements, there were transverse oscillations of the whole front portion of the car.

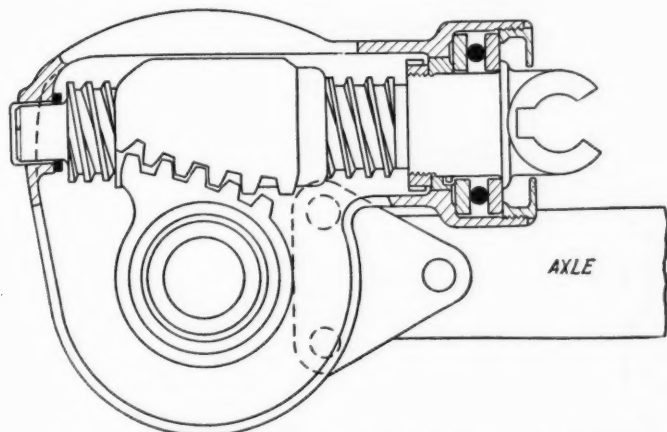


Fig. 2. Waseige duplicate steering gear—screw, nut and sector

With the double steering, each wheel being free to oscillate independently of the other, the movement was nearly always confined to one wheel and there were no transverse oscillations of the radiator and the hood—in other words no shimmy. On the few occasions when the two wheels did wobble together, their movements were in contrary directions. Generally, however, wobble was limited to the wheel carrying the lighter load, this being the one near the crown of the road, while the opposite wheel was perfectly steady. The Waseige experiments proved most conclusively that there could not be shimmy without synchronized oscillations in a horizontal plane of the two front wheels.

In addition to removing shimmy, the double steering gear increases the factor of safety and is entirely irreversible under such conditions as badly adjusted front brakes and the bursting of a balloon tire. During the experiments a 7 in. tire was intentionally burst at speed without any reaction being transmitted to the steering wheel. Under similar conditions, with a normal steering gear, it is doubtful if any man would have been strong enough to hold the car. Another experiment, carried out in the presence of the writer, was to drive the car into a high curbstone in such a way that a violent blow was

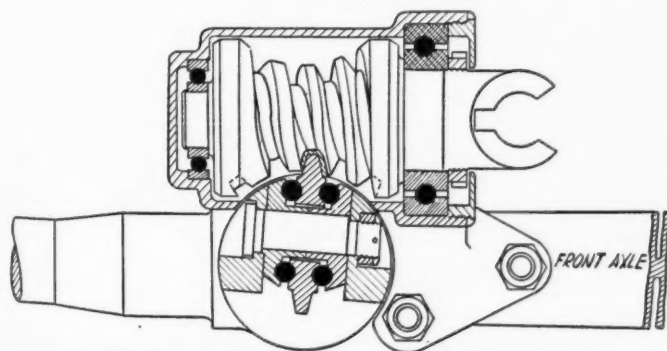


Fig. 3. Waseige duplicate steering gear—hourglass type of worm and disc

struck at the front wheels. Normally the wheel would have been wrenched out of the driver's hands, but with the Farman duplicate steering no reaction was felt. During a series of such blows, with the car running at 35 m.p.h., it was possible to hold the wheel with one hand, and although the entire car was pushed outward in the reaction against the blow, there was no shock to the wheel.

In studying the shimmy problem, Waseige carried out a series of experiments with longitudinal attachment of the axle to the chassis by means of radius rods. The results, from the standpoint of stability and brake efficiency, were most encouraging, and there was the further advantage that the axle could not change its position, in relation to the chassis, by reason of the breakage of a spring. These experiments appeared to indicate that there was advantage in securing the axle by means of rods and relying on coil springs or similar systems for suspension. At certain speeds, however, this method of attachment set up such a violent degree of shimmy that it had to be abandoned, and it was these conditions which led to the study of dual steering gear.

Inclination Angles Studied

Before adopting the duplicate steering gear, experiments were made with various angles of inclination of the steering pivot in relation to the wheel. With a vertical steering pivot (Fig. 4A) and the two axes converging at the point of contact with the ground, shimmy was rare, but when it did develop the oscillations were very rapid. Another experiment (Fig. 4B) was made with a vertical steering pivot, the tire being in the median axis

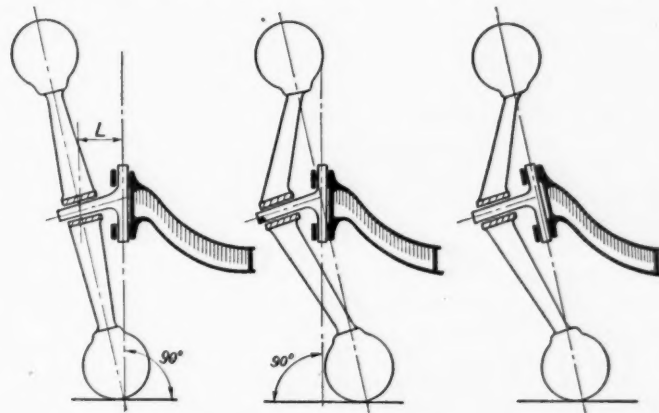
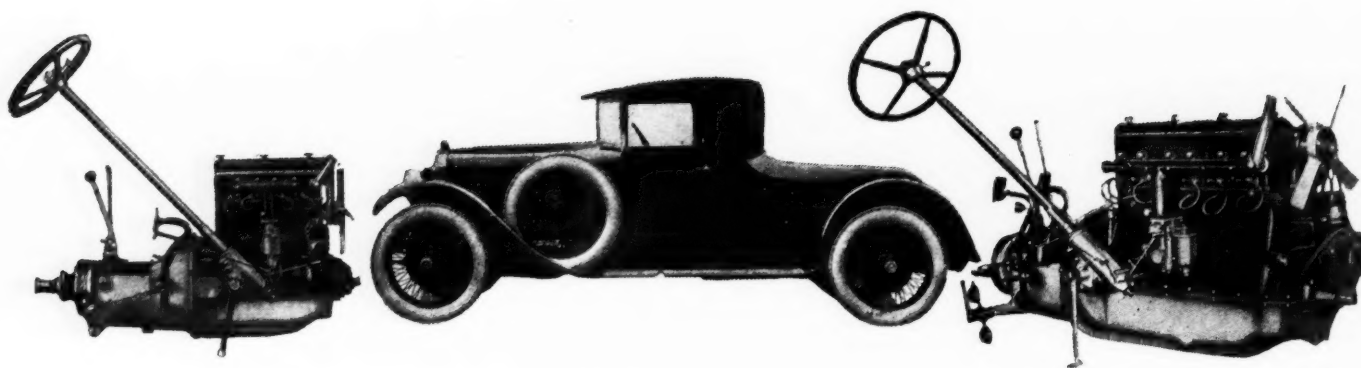


Fig. 4. Arrangements of wheels and steering pivots with a view to eliminating wheel wobble

of the pivot, but not converging. The result was encouraging, but as soon as a rearward inclination was given to the steering pivot to improve the road-holding qualities of the car, most violent shimmy developed. A final experiment was made with an inclined pivot, the tire in the median axle of the pivot and converging at the point of contact with the ground (Fig. 4C). The results were the same as in the second experiment. All these trials were made under the most favorable conditions for provoking shimmy (ball bearing steering pivots, 7 by 30 in. balloon tires, no shock absorbers, very flexible springs and the axle attached by radius rods).

THE French civil department of aeronautics and aerial transport received 142,679,190 francs in the 1926 Government budget, compared with 152,581,700 francs in the 1925 budget. The largest single item in the 1926 budget is that covering subsidies for air navigation companies—60,500,000 francs.



Four-cylinder Ansaldo engine

Ansaldo coupe

Six-cylinder Ansaldo engine

Ansaldo, of Italy, in Production on Three Chassis Models

Two "fours" and a "six" offered in wide range of body styles at prices running from \$2000 to \$2500. Record set recently in 6200-mile run without stop.

THE Ansaldo is an Italian car which has attracted considerable attention recently, particularly since it established a record at Miramas track, France, of running for six days and nights without a stop, covering 6200 miles at an average speed of 45 m.p.h.

The original Ansaldo was well known as one of the largest, if not the largest, engineering concern in Europe which built submarines, locomotives, ships, etc. Since the war the various sections of the enterprise have been separated by the Government into independent companies and the motor car section has been producing automobiles since 1920.

Three chassis models are in production now, Model 4-C, a 12/40 hp. four-cylinder car; Model 4-CS, a four-cylinder model similar to the 4-C but with slightly larger cylinder bore and higher speeds; and Model 6-B, a six-cylinder car developing up to 50 hp. Prices of all models range around \$2000 to \$2500.

The four-cylinder engine used has 70 mm. bore and 120 mm. stroke (about 2¾ by 4¾ in.) and develops 38 hp. at 3000 r.p.m. It is fitted with a detachable head and overhead valves. The valves are operated by an overhead shaft which has two multi-faced cams against which are continually pressed two spring loaded plungers. This feature is said to eliminate any possibility of vibration of the camshaft.

Aluminum alloy pistons are used with three rings and a scraper ring. Forced lubrication to all parts of the engine is by a gear driven pump. Pump circulation of coolant is provided. A Zenith carburetor is fitted with a hot water jacketed induction pipe. A Marelli high tension magneto furnishes ignition. The dynamo and starting motor are built as integral parts of the engine, as are the clutch and transmission.

The clutch is dry plate having two driving plates and one driven. The driving plates are lined with Ferodo and the driven plate is plain steel. The front part of the gear

box serves as a fly wheel housing and clutch housing. Three forward speeds and reverse are provided. Standard ratios are: First—15 to 1; second—8.25 to 1; third—4.6 to 1.

Final drive is by a spiral bevel and crown wheel. The front axle is of H-section and has been designed to incorporate the Ansaldo patented front wheel brake operating mechanism. The four wheel brakes are adjusted at one point. The hand brake operates on the propeller shaft. The design of the front wheel brakes is such that an unvarying pressure is maintained on the brake shoes while permitting free movement of the front wheels.

Steering is by worm and wheel with the steering box anchored to the engine to avoid the effect of chassis strains. Tecalimit lubrication is employed. Front springs are 33 by 2 3/8 in. and the rear 51½ by 2 3/16. A Marelli dynamo and starting motor are fitted with an Exide battery. Standard equipment includes electric horn, speedometer, clock, oil gage, battery indicator, Boyce motometer, and a complete set of tools.

The wheelbase is 109 in., track 51 in., road clearance 8½ in., chassis weight 1450 lb. Another model—the 4D—is identical with the 4C with the exception of a nine inch longer wheelbase, 1½ in. wider track, and, of course, slightly greater weight. A wide range of bodies are available on these chassis, including touring cars, roadsters, coupes and sedans.

As mentioned before, the Model 4CS is similar to those already described except that it has a slightly larger bore—72.5 mm.—and develops 48 hp. at 3000 r.p.m. Detachable wire wheels are standard on this model in place of the artillery type supplied on the other chassis.

The six-cylinder engine has 65 mm. bore and 100 mm. stroke (2.36 by 3.94 in.). This chassis is furnished in two wheelbases, 128 in. and 118 in. The shorter car is said to have a speed of 75 m.p.h. while the other has a maximum of 62. The mechanical details of this model are similar to those on the four cylinder models.

Just Among Ourselves

Automobiles as Objects of Art

THE idea that an automobile might be made an *objet d'art* probably would have been met with cries of "Now you tell one" if it had been suggested twenty-five years ago when the first chuggers were puffing and spitting their way along the highways. Only five or six years ago, incorporation of beauty, grace and fineness of taste was generally conceded to be feasible as a major consideration only in high priced automobiles. Today it's hard to sell a new car that doesn't meet the aesthetic as well as the transportation needs of the purchaser even in the lower price classes.

* * *

Developing Along Aesthetic Lines

BEFORE another decade is past it is perfectly possible that the automobile industry will have made a definite, recognizable contribution to the advancement of American aesthetic taste. Body color combinations are being studied with the idea that they may be made artistically correct and emotionally satisfying and not merely bizarre and capable of attracting momentary attention by their vividness. Progress in this direction already can be noticed. Then there is the beauty of a perfectly functioning mechanism, not yet achieved by the automotive engineer but constantly before him as the goal of his efforts. Twenty-five years hence we may look down on a scene of traffic congestion which will reflect color shadings and combination of hues as aesthetically satisfying as the impression made by a beautiful painting, while the emotional pleasantness of the scene will be unmarred by gear noise, body squeaks or other raucous sounds. Who shall say that in the future the automobile may not contribute to the

artistic life of the country in some measure at least, as it has contributed to the economic and social life in the past?

* * *

Next! Tombstone Men are Complaining Now

*Automobiles or tombstones?
Which do you think it
should be?
You take the gray old
tombstone.
Give the automobile to me!*

THE automobile is putting another industry out of business it seems. The tombstone makers now accuse the younger generation of always having money to spend for automobiles but frequently finding it difficult to purchase tombstones. "The automobile industry must be coped with," said the president of the Memorial Craftsmen of New Jersey the other day before a meeting of that organization. The tombstone makers may have their hardships but at least they probably aren't troubled with a used tombstone problem.

* * *

General Price Cut Unlikely Now

THERE is practically no indication of price reductions as a result of the new models which have been announced thus far. The slight downward trend which was revealed by the price changes which occurred during the second quarter gives no sign of being renewed at the present time. Whether or not another tendency downward develops in the last quarter remains to be seen. It seems reasonably certain, in any case, that no general price movement is to be expected immediately.

* * *

Number of Models Growing Larger

A STRONG disposition to increase the number of body

models has been evident, however, for some little while back. The middle and high priced lines especially have been reaching out to offer something attractive to every small corner of the market and to the taste of every possible type of customer. Thirty to fifty body models are not uncommon today while the number of color and upholstery combinations available in a given line may run well into the hundreds. With this desire on the part of each car maker to appeal to every possible type of buyer and with the constantly improving quality of the vehicles there is little reason to expect major price declines in the industry as a whole except under the pressure of severe competitive factors.

* * *

Yesterday and Today in Transportation

QUEEN MARIE of Rumania took a day off from commending the good qualities of face powders and vanishing creams the other day to drive for a few miles the first steam locomotive ever built in Rumania. It is rather hard for the lay observer in this country to realize that there are still many countries in the world today where a steam locomotive—for fifty years a commonplace product of American industry—has never been built. The steam locomotive is the original development of a past generation so far as America is concerned. Motor transportation is the child of the present generation. The event emphasizes again the gaps which remain to be bridged in many areas of the earth before the whole world reaches the state of transportation convenience and efficiency already achieved by this country; and to emphasize the vast market for motor vehicles which exists because of the desire of other nations to bridge that gap.—N. G. S.

New Ryan Monoplane Permits Change of Engines in 20 Minutes

Entire nose of ship, including motor, demountable. Wing is attached directly to structural part of fuselage.
Weight of plane fully loaded is 1750 lb.

By Athel F. Denham

FEW airplanes designed for commercial purposes have ever met with as immediate a success on the bringing out of the first model as has the Ryan M-1 Monoplane built by the operators of one of the first successful commercial air lines in the United States, that between Los Angeles and San Diego. The designers have had a peculiar advantage in being able to visualize through their own operating experiences the necessary requisites for a successful commercial plane.

In the design of the M-1, the important factors kept in mind throughout are those of simplicity and sturdiness of construction, facility of repairs, a quickly demountable powerplant installation, good visibility, and especially the ability to carry a large pay load at a high rate of speed at the lowest possible cost per mile. That the Ryan Airlines, Inc., has succeeded in embodying these requisites in its first plane is shown, not only by the excellent performance of the ship both in its test flights and in actual service, but also by the fact that the Pacific Air Transport, Inc., which holds the Government contract for carrying of air mails between Seattle and Los Angeles, has adopted the plane for regular use.

The plane is a semi-thick wing, externally braced monoplane originally designed around the Wright Whirlwind engine, but readily adaptable to a number of engines. The entire nose, including the engine, is demountable, making it possible to change motors in twenty minutes and eliminating the necessity of a large number of reserve planes for operating companies. The wing mounting is rather unusual. Heretofore, in monoplanes not of the parasol or low-wing type, it has been necessary to place the pilot's cockpit in the nose of the plane in order that good visibility might be obtained. In the M-1 the wing is attached directly to the structural part of the fuselage, but the cowling below the wings has been cut out in such a manner that good visibility is obtained on all sides, as may be seen from the accompanying photograph. The ship has been built throughout with a minimum safety factor of seven to one, in spite of which, when carrying a pay load of 650 lb. with a Wright Whirlwind engine, the plane fully loaded weighs but 1750 lb.

The wing, which has a spread of 36 ft., is constructed

of wood throughout, with fabric covering, the Clark Y air foil section being used. Warren truss-type ribs and beams of box construction are built up of laminated spruce, the wooden construction having been adopted to keep the wing, which is built in one piece, as light as possible.

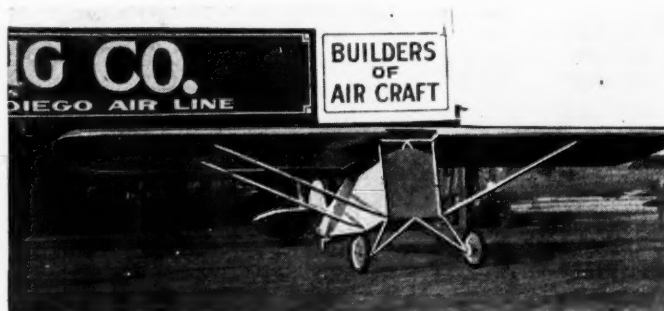
The wing struts are streamlined steel tubes, the streamlining having been given an air foil section, thereby obtaining considerable useful lift from the struts in place of the pure resistance which would have been added if wire bracing or old type struts had been used.

Fuselage of Steel Tubing

Following up to date practice, welded steel tubing has been used throughout in the construction of the fuselage. The structure, similar to the wing, is of the truss type, all wire bracing being thus eliminated. In fact it has been the aim throughout to eliminate as far as possible all wires, the only wiring retained being that of the elevator and rudder controls, thus reducing maintenance work. As has been noted above, the cowling at the front has been so cut away under the wing that good visibility is obtained by both pilot and passengers. Furthermore, this type of construction has made it possible for doors to the cockpit to be cut in the side of the fuselage, facilitating entrance to the cockpits and the loading of mails or packages in the passenger compartment in case the plane is to be used for that purpose. When the plane is used for mail carrying, the 36 x 44 x 48 in. compartment provides space for five full-size mail bags.

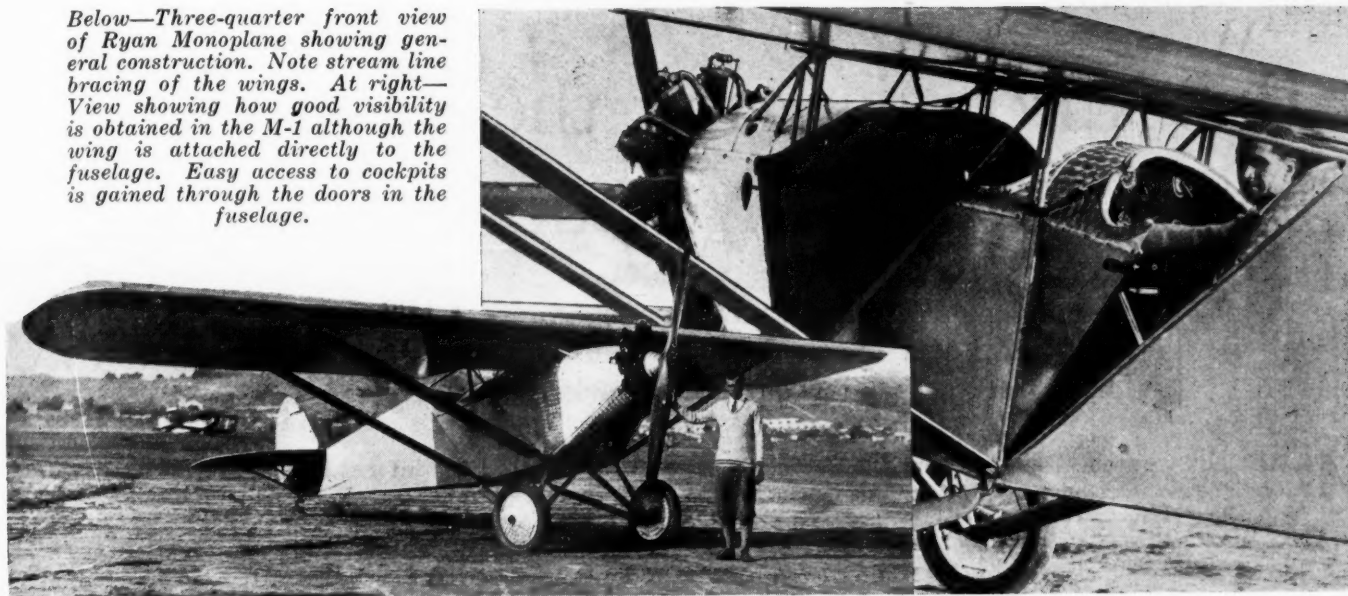
The engine mounting, which is detachable by means of removing four bolts, the tail surfaces, and the landing gear, which is of the usual split axle type with a wide tread, are also of all-steel construction, chrome-molybdenum steel tubing being used throughout. The tail skid is of the spring leaf type, is steerable on the ground in connection with the rudder control, and is demountable by removing three pins. The rudder is balanced, and the stabilizer is adjustable from

the pilot's cockpit in flight. The gas tanks are located in the wing on each side of the fuselage, each tank holding 28 gallons, giving the plane a 500-mile cruising range. Fuel feed to the carburetor is by gravity. Stick control



Front view of Ryan Monoplane with nose removed, showing unusually clean lines and simplicity of construction. The powerplant installation is attached by means of four bolts

Below—Three-quarter front view of Ryan Monoplane showing general construction. Note stream line bracing of the wings. At right—View showing how good visibility is obtained in the M-1 although the wing is attached directly to the fuselage. Easy access to cockpits is gained through the doors in the fuselage.



PERFORMANCE OF RYAN M-1

	Wright Whirlwind Engine	Super Rhône Engine	Hispano Suiza Engine	Curtiss OX-5 Engine
Cruising speed.....	115	105	110	95 m.p.h.
High speed.....	135	112	125	100 m.p.h.
Landing speed.....	45	38	45	40 m.p.h.
Initial climb per minute	1,200	900	1,000	800 feet
Climb in ten minutes...	9,000	6,000	7,000	5,000 feet
Service ceiling.....	17,500	12,000	15,000	9,000 feet
Pay load.....	600	400	500	300 lbs.
Cruising range.....	500	500	400	500 miles
Horsepower.....	200	120	150	90 hp.
Price.....	\$8,400	\$2,890	\$3,500	\$2,890

is used for the independently operated ailerons and elevators. Rudder operation is by the usual pedal control. Although the plane is of the open cockpit type, it is claimed that protection from the airstream is procured by the contour of the wing so that the pilot is able to fly without helmet or goggles.

Similarly to several larger monoplanes built recently in this country, the designers have been able to embody in the Ryan M-1, in addition to a low center of gravity, natural stability, especially when flying speed has been lost. The wing and aileron design have been so carried out that the ailerons will be operative after the stalling point has been reached. In case of a stall, it is stated, the plane does not go into a spin or nose dive, but settles slowly toward the ground. This feature is of considerable advantage when landing in small fields as "floating" characteristics are eliminated, the plane being brought to the ground with the nose slightly raised. The gliding angle, however, is approximately ten to one.

Performance Records

The performance of the ship is highly satisfactory. The first plane on a 2600-mile survey trip for the Pacific Air Transport, Inc., broke a number of records for cruising speed between certain Pacific Coast points. The second plane took off from the Vancouver, Wash., field with 1460 lb. useful load, 360 lb. more than the weight of the plane itself, and made a 1050 mile non-stop flight to Los Angeles at an average speed of 117 m.p.h.

The planes are now in regular operation on the Pacific Coast and according to reports no trouble has been experienced with them. The ship has a speed range of

from 45 to 135 m.p.h. when equipped with a Wright Whirlwind engine. With this engine its cruising speed is about 115 m.p.h., at which speed the plane has a fuel consumption of 10 miles per gallon. The initial climb of 1200 ft. per minute, and the landing characteristics mentioned above, enable it to be used on routes where small fields are the rule rather than the exception. Its price of \$8400 with a Wright Whirlwind engine, or \$2890 with a Super Rhône or Curtiss OX-5, puts it well within the range of the average concern desirous of entering the air transport field.

On previous column is a summary of the performance of the Ryan M-1 with various engines.

Bus Baggage Racks

ONE solution to the baggage handling problem which has confronted bus builders has been found by the Baker-Raulang Co., through the use of luggage lofts located inside the bus and above the seats. They occupy the same relative position that similar racks do in railway coaches and provide a place for the hand luggage of each passenger adjacent to his seat where he can assume full responsibility for its care.

The loft consists of a formed metal shelf which is supported from the body sides by pressed steel brackets so attached as to carry the shelf well above the heads of seated passengers. The brackets also serve to divide the shelf into individual compartments so that the occupants of each seat have their own baggage rack.

In the bodies being built by Baker-Raulang, the compartments near the entrance door and across the rear are longer, to accommodate golf bags and similar large bulky objects. All the compartments are lined in order to prevent scratching the baggage and to deaden any noise. The under side of the loft is trimmed with materials to harmonize with the interior of the body.

Along the front of the luggage loft is a rail which serves primarily to prevent the baggage from being tipped out of the racks when the vehicle is traversing uneven ground. It has been found that this rail also provides a hand support at the proper height for passengers moving in the aisles while the bus is in motion.

The luggage lofts are so strongly constructed and are so ample in size that there is little difficulty in caring for all the baggage usually carried by passengers, even when the bus is loaded to capacity.

Buses Popularizing the Motor Car in Other Countries

People learning the advantages of motor transportation by patronizing bus lines. Experience likely to cause demand for private cars later on. Bus market data is presented.

MOTOR bus transportation has undergone considerably faster development in foreign lands than any other type of vehicular movement. Whereas in this country bus development came after widespread ownership of passenger cars had made riding on rubber popular, it seems apparent that in many other localities extensive use of buses will be the greatest factor in educating the people in the advantages of motor transportation and so assist greatly in developing markets for passenger cars and trucks.

The greater development of buses is plainly evidenced when one considers that while the United States operates about 20,000,000, or over 83 per cent, of the 24,000,000 motor vehicles in use throughout the world, we have only some 80,000, or 44 per cent, of the 182,000 buses in use. In Europe alone there are about 76,000 buses in use, or only a few thousand less than are operated in this country, while the total number of vehicles there are some few more than two and a half million as compared with the nearly 20,000,000 in the United States.

Doing the Pioneering Work

As few countries are sufficiently prosperous at the present time to permit any great number of their inhabitants to purchase automobiles, it is very fortunate that the development of bus transportation affords them an inexpensive method of learning what advantages there are in riding on rubber. There seems little doubt that, in many countries at least, buses will do the pioneering work of selling the public on motor transportation and the success of these efforts will have a considerable influence on future sales of other types of vehicles.

Because of these reasons, recent activities of the Department of Commerce, Automotive Division, in collecting and publishing information concerning the state of the market for buses in the principal countries of the world,

as well as obtaining information about the local preferences in chassis and body types, the types of agencies which are operating bus lines, etc., while of particular interest to bus manufacturers is also of value to car manufacturers. This is true because it seems sure that in those countries where buses are meeting with public favor, one item of sales resistance—ignorance of the advantages of motor vehicle transportation—is being overcome and sales of all types of motor vehicles should become easier as the people's experience with buses expands.

In the accompanying table is presented some of the more important items included in the reports of the Automotive Division referred to before. Of all the world markets, Europe appears to offer the poorest possibilities to American manufacturers of buses. In only a few European countries does the Department report that sales prospects are very promising. This, in large measure, is due to the fact that European countries have considerable automotive industries of their own and protective tariffs eliminate most foreign competition.

Apparently there are very few opportunities for sale of bus bodies. This is due not only to protective tariffs and high freight rates but to the development of small local body shops in nearly every locality. There appears to be possibilities for developing markets for bodies which can be shipped knocked down, thus avoiding exorbitant freight charges, but even such ventures will undoubtedly find it hard going against local competition.

In a table of this sort it is, of course, impossible to present all the items of information which are contained in the detail reports published by the Department. If additional information is desired about any particular market it can be obtained from Trade Information Bulletins Nos. 393, 404, 416, all prepared by H. C. Schuette and covering bus markets in Europe, Canada and Latin America, and Asia, Africa and Oceania, respectively.

Bus Lines and Markets in Foreign Countries

Country	No. of Bus Lines	Total Mileage	No. of Buses in Operation	Principal Operating Agencies	Popular Chassis Types	Popular Body Types Seat Cap.	Are American Chassis Used?	What are Possibilities of Developing this Market?	Conditions of Market for American Bodies
Europe									
Austria	102	1210	250	Government	Light express & heavy type trucks	9-12 and 12-18 cap.	No	Poor	Poor
Baltic States									
Esthonia	50	1550	150	Companies	.....	.....	Yes	Poor now, will improve	Poor
Latvia.....	40	750	140	Companies	1½ T. Truck	10-15	Yes, 90%		Poor

Country	No. of Bus Lines	Total Mileage	No. of Buses in Operation	Principal Operating Agencies	Popular Chassis Types	Popular Body Types Seat Cap.	Are American Chassis Used?	What are Possibilities of Developing this Market?	Conditions of Market for American Bodies
Belgium .....	...	...	1000	Individuals	Light Truck	.....	Extensively	Limited	Poor
Czechoslovakia..	260	1800	500	Government	3 to 5 T. Truck	16 and 25	....	....	Poor
Danzig .....	...	...	71	Companies & Government	.....	.....	.....	.....	.....
Denmark	360	...	820	Companies	Bus Chassis	14-20	50%	Uncertain	Poor
Finland	275	...	900	Individuals	1 T. Truck	20	....	Good	Poor
France .....	...	...	34,000	Companies	Std. Truck & Pas. Car	40-50 for city use	No	Poor	Poor
Germany .....	...	...	500	Companies	Bus Type	40	....	Good	Good
Great Britain ..	3200	...	18,000	Companies	Bus Type & Std. Truck	14-20 and 40	Yes	Good	Fair
Greece	140	...	1700	Individuals	1 Ton Truck	.....	Yes	Fair	Poor
Northern Ireland	170	...	780	Companies	Pas. Car	20	Yes	Good	Poor
Italy .....	...	...	4700	Companies	Truck & Bus	30-35	No	Poor	Poor
The Netherlands	520	1100	1800	Companies	Bus Type	10-40	Yes	Good	Poor
Norway	445	7700	960	Companies	1½ T. Truck	25-30	....	Good	Poor
Poland .....	...	...	475	Municipalities & Individuals	Truck & Pas. Car	1½	Yes	Good	....
Portugal .....	...	...	175	Individuals	Truck	14-20	No	....	Poor
Rumania .....	...	...	500	....	....	....	Yes	Fair	Fair
Spain	882	...	5000	Companies	1½-2 T. Truck	....	Yes	Good	Fair
Sweden	1050	...	2500	Individuals	Bus Type	....	Yes	Good	Poor
Switzerland	217	1450	230	Public Utility & Government	Swiss	16	No	Poor	Poor
Canada and Latin America									
Canada .....	...	...	2000	Companies	Std. Truck & Bus	18-29	Yes	Good	Good
Argentina	60	...	1050	Individuals	Std. Truck & Bus	24 long. seats	Yes	Good	Poor
Bolivia	5	186	10	Individuals	Passenger Car	30	Yes	Good	Good
Brazil	70	...	150	Individuals	Bus	25-35	Yes	Fair	Poor
Chile .....	...	...	1200	Individuals	Small	16-24	Yes	Fair	Fair
Colombia .....	...	...	140	Individuals	Truck, 1-1½ T.	12-16	Yes	Fair	Poor
Costa Rica .....	...	...	50	Companies	Small Truck	15	Yes	Fair	Poor
Cuba .....	...	...	1150	Individuals	Small Truck	16	Almost all	....	Poor
Dominican Rep..	...	...	15	Individuals	Truck & Pas. Car	20-25	All	Good	Good
Ecuador .....	...	...	20	....	1 T. Truck	20	Yes	Poor	Poor
Guatemala .....	...	...	15	....	Pas. Car	....	....	....	....
The Gulanas .....	...	...	40	Individuals	....	20-25	Yes	Fair	Poor
Haiti	15	...	50	Individuals	1½-2 T. Truck	20-35	Yes	Good	Poor
Mexico .....	...	...	400	....	Pas. Car & Truck	10-18	Almost all	Fair	Poor
Panama .....	...	80	180	....	1-1½ T. Truck	10-16	All	Good	Fair
Peru .....	...	280	...	Individuals	Small Truck	30	80%	Good	Good
Porto Rico .....	...	...	300	Individuals & Companies	2-3 T. Truck	16-22	Yes	Fair	Fair
Salvador .....	...	...	20	....	Pas. Car	....	All	....	....
Uruguay .....	...	...	200	Individuals & Companies	Pas. Car & Truck	15-20	Yes	Good	Poor
Venezuela .....	...	...	37	....	Pas. Car & Truck	....	Yes	Good	Fair
Asia									
Arabia .....	...	...	60	....	....	....	....	Good	....
Brit. Malaya .....	...	...	2000	....	Pas. Car	8-10	80%	Good	Poor
Ceylon .....	...	...	1760	Individuals	Pas. Car & Truck	....	....	Good	Poor
China	70	...	480	Companies & Individuals	Truck	12-15	Few	Good	Fair
F. Indo-China ..	...	...	600	Individuals	1-1½ T. Truck	....	....	Fair	....
India .....	...	...	2000	Companies & Individuals	Truck & Pas. Car	8-10	Few	Good	Poor
Japan .....	...	...	1600	Companies	Truck	13-18	Yes	Good	Poor
Netherlands East Indies .....	...	...	300	....	....	12-30	Yes	Good	Poor
Palestine .....	...	...	195	Individuals	1 T. Truck	12-13	Yes	Good	Poor
Philippine Is. ..	...	...	1760	Individuals	Pas. Car & Truck	27-32	Yes	Good	Poor
Slam .....	...	...	100	Individuals	Pas. Car	....	....	Poor	Poor
Africa									
Egypt .....	...	...	1000	Companies & Individuals	Truck	16-20	....	Fair	Poor
Morocco .....	...	...	2100	Companies & Individuals	Bus, Pas. Car	....	Nearly all	Good	Poor
South Africa ...	...	...	450	Government & Individuals	1-1½ T. Truck	25	Yes	Good	Poor
Australia									
Australia .....	...	...	1653	Company, Individual & Government	Bus	25	Yes	Good	Poor
New Zealand ...	...	...	1386	Companies & Municipalities	Truck	....	Yes	Good	Poor

A SPECIAL cast iron for engine cylinders known as Perlit has been developed by Heinrich Lang & Co., gas and oil engine builders of Manheim, Germany. This iron has been introduced also in England and is used chiefly for the cylinders of large oil engines which have a tendency to distort and "grow" in service.

By carefully controlling the composition of the melt and

heating the core in accordance with the thickness of the section it has been found possible to produce a pearlitic structure at all sections. The metal is tough and malleable and shows a marked difference as compared with ordinary cast iron, it is claimed. The gray iron thus produced is said to be remarkably low in its silicon content which explains its freedom from growth at high heats.

New Factory Equipment and New

"Lo-Hed" Electric Hoists

SIX new electric monorail hoists, ranging in capacities from three to twelve tons, are announced by the American Engineering Company, of Philadelphia, as additions to its line of "Lo-Hed" hoists. Each of the new hoists is made in types for bolt suspension, hand geared trolley, motor trolley and cab control. Open cabs are provided for indoor use and closed cabs for outdoor service. The hoists can also be supplied with push-button control or remote control. Foundry-type control is provided when desired.

These hoists, which are designated as "Class J, Lo-Hed" electric hoists, embody the same general principles of design that characterize the other models of the line, but have greater speeds and larger load capacities. The Lo-Hed line now includes hoists from ½-ton to 12-ton capacity.



New "Lo-Hed" electric hoist, Model J

In all of the hoists the drum and motor are placed on opposite sides of the I-beam track, so that the load block can be drawn up between them until it almost touches the rail, thereby making it possible to handle larger loads and stack goods higher.

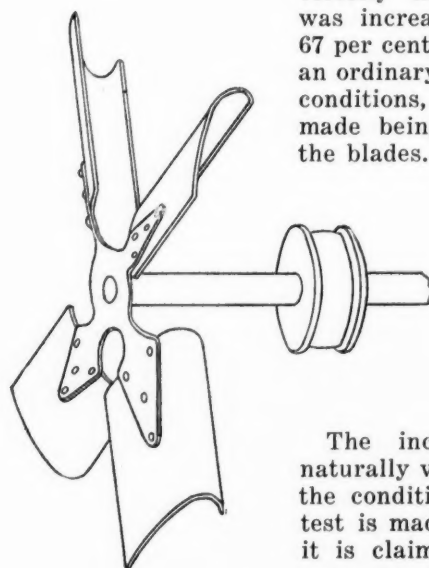
The hoist operates on standard I-beams, through switches and around curves. Hyatt roller bearings are fitted on the trolley wheels and ball thrust bearings between the wheels and the trolley frames. The trolley trucks are swiveled for going around curves of short radius.

Wellco Fan Blades

A RATHER radical departure from common practice in designing the blades for radiator fans has been made M. R. Wells, of Cleveland, O., who has received a patent on the type of fan illustrated herewith, and which is

known as the Wellco. The patent relates only to the peculiar contour of the blades.

It will be noticed that the rear edge of each blade is curled to such an extent that it slopes toward the direction of rotating almost the same as the forward edge. One might be inclined to think that this would tend to retard the flow of air, but Mr. Wells assures us that tests show a very decided increase in air flow. In some tests the air velocity through the radiator was increased by as much as 67 per cent over the delivery by an ordinary fan under the same conditions, the only change made being the reshaping of the blades.



Wellco radiator fan with specially designed contour of the blades

The increase in air flow naturally varies somewhat with the condition under which the test is made. The Wellco fan, it is claimed, will deliver the same amount of air against a greater pressure head than the ordinary fan, and is, therefore, of particular advantage where the outlet from the engine space is somewhat restricted, so that pressure builds up under the hood. In some tests made the same air velocity through the radiator was obtained with two Wellco blades as with four ordinary blades. It is recommended, however, to use four blades of the Wellco type and take advantage of their greater air delivery by using a radiator core of smaller depth.

Lepel Spark Converter

A DEVICE for modifying the character of the ignition spark of battery and magneto systems, especially at high engine speeds, has been placed on the market by the Lepel Ignition Corporation, 117 W. 63rd St., New York. It is understood that this device has been on the European market for some time, and that it is regular equipment on at least one car in Germany.

As shown by the sectional view, the device consists of a moulded body of Bakelite into which are inserted a number of aluminum disks or buttons separated a distance of about .001 in. by mica rings or washers. A wood screw serves as a connector to the ignition cable and is moulded into the body at one end, while a snap clip suitable for attachment of the converter to the spark plug is fastened to the other end. The spark in passing to the spark plug is compelled to jump a series of exceedingly short gaps, whereby its character is influenced with a resultant reaction on the ignition coils.

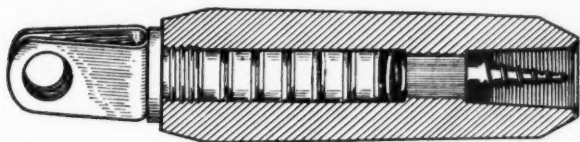
The purpose of the converter, which might also be termed an "interrupter," is to maintain the normally high ohmic resistance of the spark plug gap, which is

Automotive Parts and Accessories

ordinarily from 2500 to 10,000 volts, depending upon the compression, the length of gap, the form of the spark plug points, etc. However, under usual conditions, once the dielectric resistance of the gap has been broken down, the resistance reduces so that the voltage required to maintain an arc is less than about 100 volts immediately after the initial spark and continuing until the spark is entirely quenched. Thus the secondary winding of the coil circuit is practically short circuited, and there exists a very pronounced wattless component, or in other words, a very low power factor. This decrease in gap resistance prevents the quick elimination of the coil flux with its consequent reaction on the coil windings.

The effect of the converter is being demonstrated by means of a revolving spark gap as used in testing ignition apparatus. The high tension current impulses are conducted to the terminals of this revolving gap by means of one sliding insulated and one grounded lead, the spark appearing on the disk of the device as an arc-shaped streak intensely bright at one end, and tapering down in brightness toward the other end known as the "tail." This is the ordinary spark as furnished by the conventional battery or magneto system. Sometimes with a magneto a second bright spot appears which is known as the "closing spark," due to the closing of the primary contact points.

When a Lepel converter is inserted in the circuit the demonstration shows that the spark assumes different characteristics. The duration of the discharge is materially decreased, by at least one-half with battery systems and with a magneto to about one-sixth and less when under compression. At the same time the intensity is increased and is substantially uniform during the duration of the spark, instead of "trailing off" with the usual tail. A millimeter placed in the secondary coil circuit shows an approximate doubling of the current flow with the Lepel device in the circuit, and an ammeter in the primary circuit of the battery system shows that this is accomplished with no increase in primary current.



Sectional view of Lepel converter

An ordinary exterior spark gap placed in the circuit in place of the Lepel converter has the effect of shortening the tail of the ordinary spark, that is, shortening its duration, but it does not increase its intensity over the period that remains. It therefore acts mainly as a constant ohmic resistance in series with the plug.

Points Are Kept Cooler

By materially shortening the duration of the spark, through what may be termed its interrupter action, and causing the entire energy of the spark to be concentrated and delivered across the plug points in a much shorter time than normally, the magnetic flux is entirely cut off after each spark, with a resultant reduction in burning or pitting of the contact points in the primary circuit and a tendency to keep the spark plug points cooler due to the elimination of the arcing effect or "tail." The

cooling effect is also being demonstrated in the Lepel laboratory. By running the ignition device at high speed it is possible to heat the points of a spark plug in the atmosphere to redness, whereas with the converter in the circuit there is hardly any perceptible increase in the temperature of the points while there is an increase in the heat produced in gaseous area across the gap. Another characteristic of the spark as obtained with the Lepel device is a sort of blowing effect, which can be clearly observed by holding the flame of a match in the spark plug gap, when there is a tendency to blow it out, whereas without the converter in the circuit the match flame passes through the spark and over the plug points. The demonstrations above referred to were with the spark points in the open air and not subjected to compression.

It is claimed for the Lepel converter that due to increased spark heat, engines will show increased power and speed and decreased fuel consumption; also, that spark plugs will not easily foul in over-lubricated engines and that pitting of primary contact points is materially reduced. Dynamometer and road tests of engines equipped with Lepel converters are now being made by manufacturers and others interested in ignition equipment.

Six Cylinder Airplane Engine

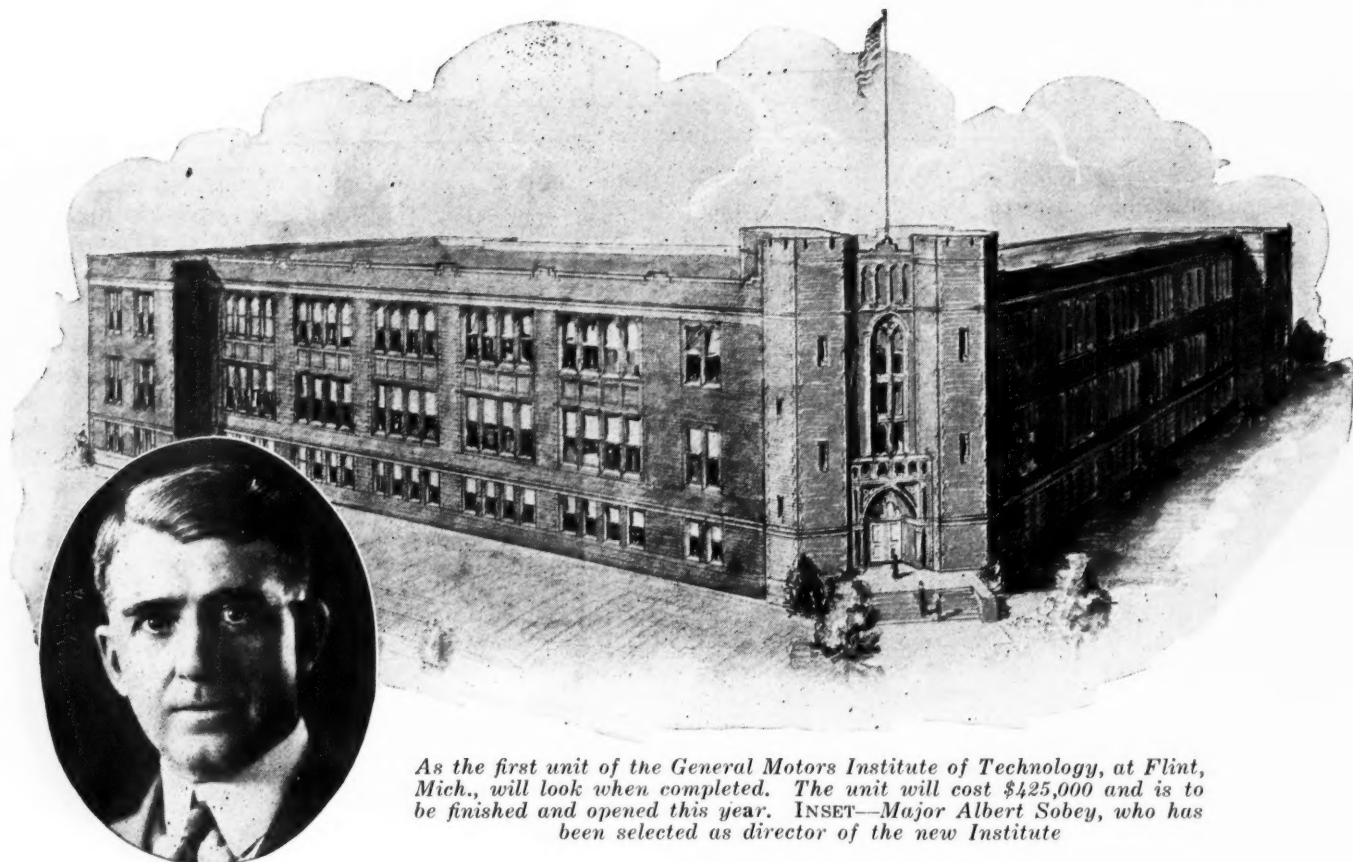
A six-cylinder, water cooled, light aircraft engine has been designed in France by Henri Vaslin, and has been tested out in a Dewoitine plane. The engine which has a bore of 75 mm. (2 15/16 ins.) and a stroke of 86 mm. (3 25/64 ins.) develops 52 hp. at 2600 r.p.m., with a compression ratio of approximately 6.0 to 1.

The crankshaft is of the five bearing type, ball bearings being used at the front and rear, and bronze bushings on the intermediate bearings. The carburetor, the two 3-cylinder magnetos, and water and oil pumps are mounted at the rear of the engine. The camshaft is enclosed in the crankcase, the valves, located in the cylinder heads being operated by push rods and rocker arms. Connecting rods are of forged tubular steel and are only 152 mm. (6 ins.) long.

The total dry weight of the engine is 77 kgs. (170 lbs.) giving a weight per horsepower ratio of 2.21, which is satisfactory considering that the engine has been designed chiefly for reliability and long life.

The engine is said to represent one of the most promising types of light aircraft engines designed in France during recent years.

THE exacting requirements which must be met by aircraft engines and the difficulties encountered in testing them over a wide range of service conditions are clearly shown in the exhibit of the Bureau of Standards at the Philadelphia Sesqui-Centennial celebration. This exhibit includes a model of the altitude laboratory with the parts labeled and partially cut away so that the operation of all the equipment is easily understood. In addition to the model of the altitude laboratory, a chart is shown giving the decrease in engine power with increase in altitude, and another model illustrates the "ceiling power" of airplane engines.



As the first unit of the General Motors Institute of Technology, at Flint, Mich., will look when completed. The unit will cost \$425,000 and is to be finished and opened this year. INSET—Major Albert Sobey, who has been selected as director of the new Institute

New General Motors College to Offer Wide Range of Courses

Provisions made for training of men and boys in all branches of automotive industry. First unit of school to be constructed this year at cost of \$425,000.

By Lewis Dibble

EDUCATION, along with research and other phases of modern manufacture, is to take a definite place in General Motors Corporation's fixed program of affairs with the establishment of a technical college at Flint, where employes from the various General Motors units can be given specialized technical and practical training to better fit them for their work in the automotive industry.

The new college as mentioned in our issue of July 15, will be known as the General Motors Institute of Technology, will occupy a 10-acre campus near the Chevrolet Motor Co.'s plant, and will provide educational facilities for 2000 students in day and night classes.

In many respects the college will be operated on a plan similar to that pursued at Antioch College, in Ohio, where students attend classes regularly for awhile and then work in the shops.

It is the intention of the corporation to make it possible for men taking the full-time courses to work in its

factories for four weeks and then attend classes for the next four weeks. This will make it possible for students to finance their college education and at the same time gain valuable practical experience, which is not possible with the regular college courses offered in most institutions.

Ground will be broken soon for the first building, which will cost \$425,000. It will be three stories high, will provide 65,000 square feet of floor space and will be especially equipped for technical training.

Flint is well suited for the establishment of the college, being quite centrally situated in relation to other well-known General Motors centers such as Lansing, Pontiac, and Detroit.

The idea of establishing a technical college as a definite part of the corporation's program of activities is not new. As a matter of fact General Motors has been interested in educational work for several years in connection with the Flint Institute of Technology.

Seven years ago the Flint Institute of Technology was opened by the Industrial Mutual Association, an organization whose membership is made up of thousands of Flint automobile factory workers. From the very start the institute became a great success and annually attracts hundreds of students from the factories.

Much credit for the success of the institute is due to the efforts of its director, Major Albert Sobey, who has been chosen by General Motors to direct its new college. Incidentally, the corporation's school will absorb the Flint Institute, though it will still be affiliated to a certain extent with the Industrial Mutual Association.

Bassett Behind Project

Decision on the part of the corporation to erect the college is largely due to the efforts and interest in practical educational work of Harry H. Bassett, president and general manager of the Buick Motor Co. and a vice-president of General Motors.

Mr. Bassett devoted much time and thought to the progress made by Flint Tech, and its unusual successes caused him to champion the idea of the corporation establishing a full-fledged college for its employees.

It is intended by the corporation that the college shall be without a peer anywhere in the country, as far as offering educational work of benefit to all classes of men in the automotive industry is concerned.

The program of education will be exceptionally broad and will be divided into two divisions. One division will be for full-time students while the other will be designed for persons taking spare-time work.

For the full-time students, three major courses will be offered, cooperative engineering, technical trades and automobile service.

The cooperative engineering course will be a regular four-year college course and will be open to high school graduates or men of equivalent preparation. Thorough practical training in the theory and practice of engineering and its application to modern industry, especially the automobile industry, will constitute the principal work offered in this course.

Men taking the cooperative engineering course will spend four weeks in the college and four weeks in the factories. The work in the factories will give the students an excellent, practical application of the principles of the course they are pursuing. The institute's work will cover fundamental engineering subjects and a special training in courses related to industrial engineering and management. In other words, the course is a cooperative management engineering course and will offer a very thorough and practical training for lines of work in which there is a large and growing demand for men.

Boys from 16 to 18 years of age will be especially interested in the technical trades course, which will also be operated on the cooperative plan of four weeks in college and four weeks in the shops. The course will permit them to secure a thorough training in a skilled trade, together with technical instruction in the subjects related to the trade.

A Junior Engineering Course

According to Mr. Bassett, the course is, in reality, a junior engineering training and is designed to educate the boy that he may become an efficient and intelligent workman, a first-class mechanic and a potential foreman or executive.

The automobile service course will be given considerable attention. At the Flint Tech this work has previously been largely specialized on Buick cars, but the program will be extended to include other General Motors products. This course has not only been utilized by the

Buick service organizations throughout the country, but by the General Motors Export Co., to train their service men and also to give technical training for salesmen in foreign territories. Graduates of this course are now located in 44 different states and 17 different countries.

Courses in job training, semi-skilled trades, accounting, industrial engineering, foremanship, management, and, practically every phase of the automobile industry, will be offered in the spare-time courses.

The entire spare-time program is built up of 12-week courses, which make available to the student at any time just the unit of instruction needed for the next step in advance. More than 200 of these unit courses are included in the program.

Besides the regular faculty of the institute, there are many experts from the industry who devote their spare time to giving instruction, and advisory committees of leading executives of the factories assist in making the courses of greatest practical value to the students.

The first floor of the building will be devoted to shops and automobile laboratories and will include a large machine shop and tool room, woodworking shop, forge shop, heat treating laboratory, acetylene welding, a fully equipped automobile laboratory and a service station with the most modern service tools and appliances.

The electric, physics, chemistry, mechanics and metallurgical laboratories, general lecture rooms, library, general offices and a large assembly room will occupy the second floor. The third floor will be given over to drawing and design rooms, general class rooms and student study rooms.

It is planned to have the college ready for operation early in the coming school year.

Course in Heat Treatment

UNDER the auspices of the Philadelphia Chapter of the American Society for Steel Treating an evening course in the heat treatment and metallography of steel is being given at Temple University, Philadelphia. The second year of the course was completed recently, and on that occasion an exhibition was given in the Metallurgical Laboratory of Temple University of heat-treating and metallographic equipment, specimens of heat treated steel, photo-micrographs, reports made by students, etc.

The course is in charge of H. C. Knerr, formerly chief metallurgist of the Naval Aircraft Factory, Philadelphia Navy Yard. Class work is done one night a week and laboratory work another night. Lectures on various metallurgical subjects are being given by members of the Philadelphia Chapter of the American Society for Steel Treating. Students ordinarily enroll for one year, but two years are required to complete the course.

A RESUME of much of the information which has been published from time to time in regard to the present and future rubber supply as it affects this country is contained in "Rubber," a 45-page booklet prepared by F. R. Henderson and published by Henderson, Helm & Co., 44 Beaver St., New York. The publishers are members of the recently organized Rubber Exchange and a brief history of this addition to rubber marketing mechanism is given in the book. A considerable number of maps and charts are employed to picture the growth of rubber use and production. An interesting feature about the booklet is its cover, which is a new product composed of rubber and specially treated cotton fibers.

THE FORUM

Balance of Six Cylinder Crankshafts

Use of counter weights on three and four bearing shafts urged to reduce the loads on main bearings due to local unbalance.

Editor AUTOMOTIVE INDUSTRIES:

It seems peculiar, in the face of the fact that a tremendous amount of money is spent yearly to attain perfect balance, that an unbalanced condition exists in practically all six-cylinder engines, even after "balancing." For example, let us take the conventional four-bearing crankshaft for six-cylinder engines, which has the pins spaced at 120 deg. with pins 1 and 6, 2 and 5 and 3 and 4 in the same longitudinal planes. The shaft is thus composed of three pairs of crankpins, supported by their adjacent main journals; two pairs of crankpins are set with the pins in each pair at 120 deg., the pins 1 and 6 and 2 and 5 being in the same plane longitudinally. The circle is completed with a pair of pins 3 and 4 adjacent and in the same longitudinal plane. It is customary to design unit 3 and 4 to bring the shaft roughly into static balance and remove any surplus necessary for dynamic balance, from either end.

Let us take this shaft and cut it through journals 2 and 3 (Fig. 1). It becomes three two-pin crankshafts, whereas it was a shaft of three pairs of crankpins. These separate units are not in balance, as the centers of gravity are outside of the axes of the main journals. Now, if these units are assembled into a unit shaft, as originally, the unit will be in static balance only. If the shaft is balanced dynamically it must be perfectly rigid to prevent the distortion strains from excessively loading the

main bearings, otherwise any attempt to balance the shaft is wasted.

When run at medium or low speeds the four-bearing crankshaft is quite satisfactory, but when that same design is forced up to around 4000 r.p.m. it will behave like a piece of rubber. While few engines have such a crankshaft, I believe that no high speed engine should carry a crankshaft that behaves more poorly than a plain straight shaft. Four-bearing shafts bend both locally and along their length, because of the unbalanced units (Fig. 2), unit 3 and 4 together with 2 and 5 at 120 deg. to it, form 2/3 of the centrifugal forces, and act upon the center section of the shaft, while the whole is brought into static balance by 1 and 6 throws, which, because of their end position, are unable to exert the pull required to bring the shaft axis back to center. While the total weights of throws 1 and 6, 2 and 5, and 3 and 4 are equal, the forces set up by 3 and 4 and 2 and 5 are concentrated near the center of the shaft and outside of the axis so that the effective line of unbalance when rotating, will lie along a longitudinal plane between the arms of the angle formed by unit 3 and 4, the shaft axis and pins 2 and 5. Thus the required elements for a whip, are built into the shaft. If such a shaft is balanced on a high speed balancing machine, it will show a very decided unbalance on parallel ways, with the overweight showing in the general plane of 1 and 6 throws. A certain well known bus engine is produced with a static unbalance that runs as high as 17 oz. at 3 in. radius. Slow-speed balancing will help on a flexible shaft, but the crankcase must take the additional stress due to the natural tendency to leave the proper crankshaft axis.

The use of counter weights to correct a condition of this kind is very desirable. Every engineer is familiar with the undesirable features of the counter-balanced crankshaft, but with careful design the improvement is very apt to be astonishing. Fully machined seven-bearing shafts do not eliminate local unbalance, and are a rather expensive production job. While these shafts would be improved slightly by proper counter weighing, if perfect local balance was attained the shaft would probably be susceptible to torsional vibrations, because of the low ratio of strength to weight. A four-bearing shaft with three or four counter balances seems to answer all of the requirements for ease of production, good oil distribution, reasonable weight with good torsional characteristics.

When computing the weight for the counter weight, the weight of the big end of the connecting rod should not be neglected, as this may be taken as additional weight at the crankpin and must be considered to attain perfect local

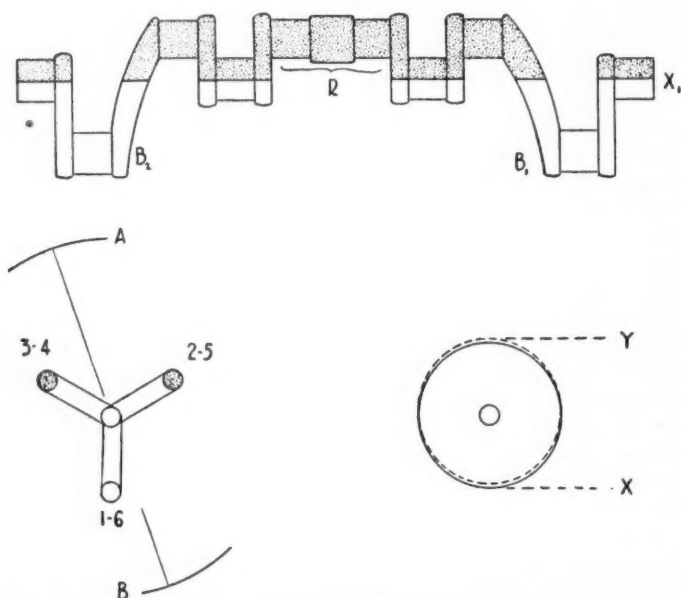


Fig. 1

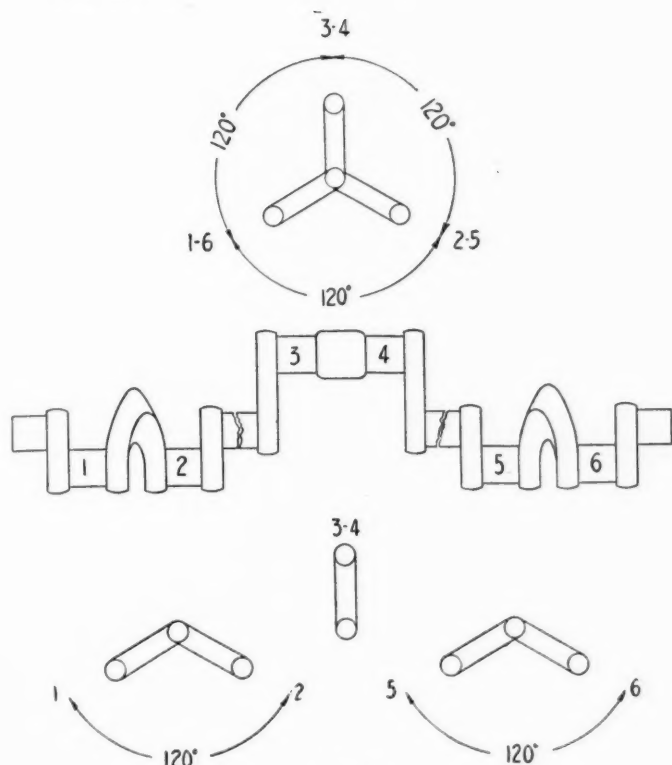


Fig. 2

balance when operating. Then, too, when balancing this shaft, weights equal to that allowed for the rotating end of the connecting rod should be applied to the journals of the shaft to secure a delicate balance, that will be duplicated under operating conditions.

Every year finds new counter-balanced jobs on the market, and, judging by the performance of those put into the hands of the public in the past, it seems that additional effort in the proper application of weights would bring its own reward in increased efficiency in that part of the engine which for a number of years has received little attention in regard to smoothness of operation or reduction of pressures.

F. WOODWARD COMMINS.

Tool Heat Speeds Production

Editor AUTOMOTIVE INDUSTRIES:

A brief history of the application of generated heat as a means of increasing production may be of interest. I was confronted with the problem of finishing cylinder bores without grinding. A first roughing cut generated local heat to the point where it was considered detrimental, because of producing distortion. A second roughing cut followed, which in turn added heat, but the original condition was less evident due to heat dissipation throughout the structure of the casting. As a result, when the bores were being reamed, the total generated heat had been distributed by absorption.

The writer decided to apply the result of his analysis to increase production and quality. He designed a revolving fixture with four loading positions to register four sets of cylinders and lock them at each point. The procedure was to rough-bore the first set of bores and revolve and index the second set. Then followed the third and fourth sets of cylinders. This meant that the first set to be rough-bored was dissipating the generated heat during a period equal to that required to rough-bore three

sets of bores, plus the time taken to change the boring heads for the second roughing cut. While this cut also added heat, it was less evident, so that the second cut was performed under normal temperature conditions, and the cylinders again went around the circuit to permit the heat to equalize.

The time period being the same, it follows that a change to reamers allowed for practically all abnormal heat to be distributed, resulting in bores finished at a temperature nearly equal to that of a cylinder operating in an engine. What was gained in operating time was evidently due to the fact that the boring heads were changed only every four sets of bores, which was quite an item. The first cylinders reamed were unloaded while the second set were being reamed, and the empty station was loaded during the time it completed the circle.

This saving in loading time and cutter changes, while evident was a natural result, while the quality of the work of finishing the cylinder bores was quite evident.

Another detail of the cutting methods employed may be of interest to those less informed regarding cylinder finishing practice. The first rougher had four tools, the cutting edges being ground on centers. The second rougher had six tools of similar design, while the reamer had eight blades. This arrangement was made to prevent one set of tools from following the other set; in other words, each set of tools eliminated the tracks of its predecessor.

Another little "kink" was to standardize three sizes of bores, $+.001$ in. $\pm .000$ in. and $-.001$ in.; these being identified by letters A, B and C stamped on each bore, to be used in ordering a piston or rings. A sharp reamer cut $+.001$ in.; later it produced a standard bore $\pm .000$, and when the bore produced by it dropped below $-.001$ in. it was adjusted and sized.

JAMES MCINTOSH.

THE Italian pilot de Pinedo is planning a flight around the world in a Marina plane (Dornier-Waal type) built at Marina de Pisa and equipped with two 500-hp. Isotta-Fraschini engines. A fund of seven million lira has been raised to finance the enterprise. Two planes are available to de Pinedo, both equipped with Reed metal propellers. Preparations for the flight are now under way and it is planned to start from Rome during the latter part of August. In crossing the Atlantic, de Pinedo plans to follow the same course as the Spanish flyers in their crossing to South America. The Andes will be crossed in the Southern part of the Continent, from Buenos Aires. The most daring part of the project is the crossing of the Pacific Ocean. Starting from Valparaiso de Pinedo will fly by way of Juan Fernandez Island, Salay Gomez, Easter Islands, Tuamotu Islands and Samoa to New Caledonia and New Zealand. The machine to be used is a hydroplane and de Pinedo will be accompanied by a mechanic, a naval officer and probably a newspaper man. Gasoline enough for 2500 miles flying can be carried.

Volume 54 Index Now Ready

The index to Volume 54 of *Automotive Industries* including issues from January 7 to June 24, 1926, is now ready for distribution. Copies of this index will be supplied gratis to subscribers who request it. Those who have requested previous indexes need not make another request because a copy of the latest one will be sent to them automatically.

Airship Ballast-Recovery System is Proved Successful in Tests

Bureau of Standards develops condensing unit for recovery of water vapor in airship exhaust gases to compensate for increase of lift through fuel consumption.

A FEASIBLE method of condensing the water vapor contained in engine exhaust gases has been developed by the Bureau of Standards and is suitable for the recovery of ballast to compensate for increased lift as the consumption of fuel tends to lighten airships. As fuel is consumed by an airship engine some means is necessary of compensating for this loss of weight in order to keep the ship in equilibrium. An obvious method is to valve some of the lifting gas but when a gas so rare and expensive as helium is used such a practice becomes very costly and quite impracticable for general use.

The Bureau investigated the possibilities of condensing the water vapor which forms part of engine exhaust gases and, after meeting with success in a small model, constructed a full size condensing unit. In Technologic Paper No. 293, Robert F. Kohr, associate mechanical engineer of the Bureau, describes in detail the construction and operation of the device developed.

Two Methods Involved

In first considering the problem Mr. Kohr writes that the maintenance of a constant total lift in lighter-than-air craft falls naturally into two distinct divisions: (1) Recovery of ballast as the consumption of fuel tends to lighten the ship. (2) Control of the temperature and thus the density of the lifting gas in order to compensate for changes of lift due to changes of atmospheric density or superheating of the lifting gas by solar radiation upon the envelope.

The problem is of great significance when helium is used as a lifting gas. It is generally conceded by those familiar with the operation of airships that valving of lifting gas must be nearly eliminated before a gas so rare and expensive as helium can be adopted for general use. Inasmuch as the known world supply of helium is largely found in this country, it constitutes a national monopoly for military use, and its conservation is therefore imperative.

In long flights both phases of the ballasting problem assume considerable importance, but, of the two, the ballast recovery appears to be the more vital. Although the development of both projects was for a time carried on simultaneously, it was thought advisable to postpone further work on temperature control until ballast recovery reached a point where satisfactory apparatus was available. This paper, therefore, deals only with the work on ballast-recovery apparatus.

The desirability of making up ballast during flight at a rate equivalent by weight to the fuel consumption has been realized since the beginning of airship navigation. A number of means of maintaining equilibrium have been proposed, including the absorption of water vapor from the air by hygroscopic substances, compression of the lifting gas into rigid containers, and condensation of the water vapor which forms a part of the engine exhaust gas.

The first of these proposals seems impracticable on account of the small quantity of water vapor present in the air under ordinary flying conditions (about 0.0005 lb./ft.³) and the immense exposed area which would therefore be required. The second method is eliminated by the great weight of compressing machinery and high-pressure gas containers. The recovery of water of combustion from engine exhaust gas by cooling and condensation, however, is feasible as a method for the solution of the problem.

When the usual gasoline fuel is used, about 1.4 pounds of water vapor is formed for each pound of fuel burned. This affords an ample margin for inefficiency in the process of cooling the gas and separating the entrained moisture, so that extreme refinements are unnecessary.

A condenser of the direct air-cooled design was developed at the Bureau of Standards which weighs about 1.5 lb. per brake horsepower. While the detail design of the test apparatus was being carried forward steps were taken to check the theory involved by a laboratory test of a small section similar to the proposed full-sized apparatus.

With this end in view a wind tunnel of 9 in. square section was constructed, served by a centrifugal blower fan driven by a small automobile engine which also furnished the exhaust gas. A condenser was made up of standard 1-in. iron pipe, with three 20-ft. banks of three in parallel, having return bands connecting the successive banks. This was installed in the tunnel and connected at one end to the engine exhaust manifold and at the other to a small baffle type separator.

Fuel is Measured

Measurements were made of gasoline consumption, exhaust water collected, air velocity and temperature, and final exhaust temperature, and as the results were found to closely check with those arrived at by calculation, the work of constructing the full size units was begun.

In general, the method is to pass the exhaust gas at high velocity through parallel lengths of about 60 feet of 1-inch aluminum tube, the outer surface of which is swept by air at a rate determined by the flying speed of the ship. For convenience the 60 feet is arranged in three banks connected by return headers, so that the overall length is about 21 feet. To handle the quantity of exhaust gas produced by the two 150-horsepower engines to be used, with due consideration for the desired velocities and back pressures, there are 50 such cooling tubes in parallel. The whole unit presents the appearance of 150 parallel 1-inch tubes in one bank whose overall length is 21 feet. Both Models I and II have this general form, although they differ considerably in details of construction and arrangement of the hot and cold banks of tubes.

Both of these units are intended for suspension between the envelope and car on classes C and D airships of the original design and are normally slanted about 6° downward to the rear to assist in draining the tubes of

condensed water as well as to provide some cross flow of the air between them, thus avoiding the loss of efficiency due to heated air coming from a hot tube and striking a cooler tube farther along. In each case a baffle type separator is provided to collect the entrained moisture from the gaseous products leaving the condenser.

The Model I Condenser

In Model I condenser the tubes are arranged so that two-thirds of the total cooling area is in counterflow; that is, having the direction of flow of the exhaust gas opposite to the flow of the air stream. In addition, if the unit be considered as two halves, front and rear, the forward half is the cooler one, thus providing a secondary overall counterflow effect.

The materials used are seamless drawn aluminum tubes with a wall thickness of 0.016 inch and headers and manifolds cast from "F" Lynite, which is an aluminum alloy containing about 10 per cent copper.

An attempt was made to streamline both the headers and header manifold in order to secure the best possible conditions of air flow around the castings and between the tubes, as well as to keep down the head resistance of the apparatus as a whole.

The Model II condenser differs from I chiefly in respect to arrangement of tubing and type of header. The flow of exhaust gas and air also is two-thirds counterflow, but no attempt was made to secure a corresponding overall counterflow effect.

The construction is somewhat similar to that of Model I, although the headers are of an entirely different type. The same materials are employed, with the exception of the first 10-foot section, which in this case is of Benedict nickel, a commercial alloy containing 16 to 18 per cent nickel, balance copper. This material is used to avoid warping of the tube due to too high temperature in this section.

The Benedict nickel, which is very easily worked, was drawn to a thickness of 0.010 to 0.012 inch, making it about 40 per cent heavier than the 0.022-inch aluminum tube. The actual weights per foot are as follows:

	Pounds
0.010 to 0.012 inch Benedict nickel	0.1208
0.022-inch aluminum .....	.0857

This makes the total weight of tubing 274.6 pounds, which is about 50 per cent higher than that of Model I. The increase in tube weight, however, is offset by a decrease in the casting weight, to such an extent that the Model II condenser is only about 9 per cent heavier than Model I. The actual weights without suspensions, exhaust-pipe connections, or separators are as follows:

	Pounds
Model I	400
Model II	434

The importance of the separators for the collection of entrained moisture can not be overemphasized. No matter how low a temperature is reached in cooling the exhaust gases, much of the water condensed remains in the form of spray and is carried along by the gases until the separator is reached. In the absence of such a device this represents a loss of about 50 per cent of the water condensed.

The separator was bolted directly to the exit elbow and extended back under the condenser. Its action depends upon the drops of water thrown against baffles and guided by small vertical gutters to holes punched through the bottom to a false bottom, from which the collected water is drained to the ballast tanks.

The exhaust gas enters at the upper right, passes be-

tween the baffles, and escapes at the left. There is a lip on the outlet end to prevent the separated water washing along the bottom past the holes and so escaping with the gas. The separator is built of tinned sheet iron and is soldered together.

From tests made with the apparatus above described the following conclusions are drawn by Mr. Kohr:

Although no claim is made for the present general design as representing the ultimate form of ballast-recovery apparatus, the feasibility of condensation of water from the engine exhaust as a means of compensating for the increased lift due to the loss of the fuel burned has been demonstrated. The weight of the apparatus is not excessive and can be wholly compensated for by a corresponding decrease in the weight of the water ballast usually carried.

Owing to the large frontal area of an airship, the head resistance of a condenser of the type thus far used represents such a small portion of the whole as to be nearly negligible. Condensers of the general type of Models I and II, having no moving parts, require little attention and should have a satisfactory flying life.

In cold weather, with a condensation in excess of the fuel equilibrium requirements, the exhaust water may also be used to at least partly compensate for the change in lift due to changing barometric pressure or temperature of the lifting gas.

Although some assumptions used in the design work appear to be only rough approximations, none of the test results seem to indicate any great error within the range of conditions thus far encountered.

Highway Research Proceedings

A NUMBER of subjects which have particular interest to automotive manufacturers were discussed during the Fifth Annual Meeting of the Highway Research Board held last December in Washington and they are fully reported in the Proceedings which have just been published by the National Research Council.

The report of the Committee on Economic Theory of Highway Improvement included the results of tests made at the Kansas State Agricultural College with respect to the wind resistance of motor vehicles. Report of an investigation of tire wear made at the University of Kansas was also given as well as the results of a series of measurements of tread rubber losses from tires operated over various types of roads which was made by the State College of Washington. A table giving the results of the experience of the Quartermaster Corps, U. S. Army, in regard to typical gasoline and oil consumption factors for various types of automotive vehicles makes an interesting exhibit.

The report of the Committee on Highway Traffic Analysis contains a number of papers and reports covering several phases of the traffic problem, all of which should prove of interest to automotive readers in view of the importance of traffic congestion in future sales prospects.

In addition to this material there is, of course, a great quantity of information pertaining directly to the technique of highway construction and maintenance.

THE N. A. Petry Company, Philadelphia, has published a booklet which contains an illustrated description of the Petry heating system for buses.



Here and There in Foreign Markets

By special arrangement with the Automotive Division, Bureau of Foreign and Domestic Commerce

First Swiss "Six" Appears

THE first six-cylinder automobile ever manufactured in Switzerland has been placed on the market in that country by the "Neue Automobil Atstien-Gesellschaft Martini," located at St. Blaise, in the Canton of Neuchatel. The price of the chassis is announced to be Swiss francs 13,000 (\$2510) and the complete cars will cost between francs 15,000 and 18,000 (\$2900-\$3475). The Martini factory produced its first motor vehicle in 1897 and claims to be one of the oldest automobile factories in the world.

Low Franc Hurts Sales

THE unsatisfactory economic situation in France is handicapping automobile sales according to a dispatch from Paris to the Automotive Division of the Department of Commerce which adds that the franc depreciation is having a particularly adverse effect on American cars. "Exports during the first five months," the dispatch concludes, "are estimated at 25 per cent heavier than the corresponding period of 1925; imports of passenger cars comprised mainly of parts for assembly, 6 per cent heavier; trucks 50 per cent less."

Spain Delays Tariff Action

THE prospects are against the Spanish Government adopting any radical steps immediately against foreign cars on account of representations having been received pointing out that the proposed discriminatory internal taxation is contrary to the spirit of the International Commercial Treaty.

German Imports Growing

IMPORTS of automotive vehicles into Germany, especially passenger cars, are increasing after a prolonged slump, while automobile exports are decreasing.

No Limitations on Fuel

THE Automotive Division of the Commerce Department is informed through consular dispatches that no limitations will be placed on the consumption of gasoline for automobiles in France this year, and probably none will be placed on the quantity consumed. Two types of fuel are now sold in France—one for trucks and the other for touring cars—and a combination of the two into a single standard fuel would, it is reported, result in a saving estimated at 200,000,000 francs annually.

Tax Hurts Mexican Sales

ASSISTANT Trade Commissioner L. M. Brin at Mexico City reports that there has been a large drop in sales of motor vehicles in Mexico during the second quarter of 1926 as a result of the 10 per cent tax which became effective April 1. It is estimated in Mexico that sales of vehicles have dropped between 75 and 80 per cent. Due to the lack of automobile sales, accessories sales

have shown a decrease, although not enough to be considered seriously. Practically no motorcycle sales were made during the second quarter.

Netherlands Luxury Tax

A NEW draft of the luxury tax in Netherlands, providing for a luxury tax of 6 per cent on passenger cars and automobile accessories, has just been submitted by the Finance Ministry to the Industrial Council, which is composed of commercial and industrial leaders in the Netherlands. The difference between this draft and the previous one is that the proposed tax will now be levied upon importation, or at the source when the article is manufactured in the Netherlands. Furthermore the number of articles subjected to taxation has been reduced to 29 groups, and the original idea of a stamp tax has been abolished.

Poles Interested in Buses

DESPITE several unfavorable factors, such as currency depreciation, credit shortage, and import tariff restrictions, a renewed interest is evident in Poland for motor buses. In one district alone more than 100 applications have been received for new auto bus line concessions. Low priced American chassis equipped with bodies built locally are now in operation and it is probable that future purchases will largely follow these lines. It would seem as though this was an opportune time to establish a line in this territory and American firms interested may secure a list of dealers by writing the Automotive Division, Department of Commerce.

More Cabs in Australia

A PROMINENT cab company in Sydney has recently placed 40 new cabs on the streets for hire, and another 160 will soon be placed in operation. Recent advices from Western Australia state that permission has been granted to the above mentioned cab company to commence operations in Perth and adjacent towns. 25 cabs will be placed in operation immediately.

Brazil Buying More Tires

BRAZIL each year is buying more American tires, according to Everett G. Holt, chief of the Rubber Division of the Department of Commerce, who announces a substantial increase in the exports of rubber products to the South American republic last year—\$1,535,997 as compared with \$694,297 in 1924. Exports of automobile casings from the United States to Brazil in 1925 totaled 91,911 valued at \$922,534, a higher value than the entire trade in rubber manufactures of the preceding year and 180 per cent greater than the value of the casings exported in 1924.

EDITORIAL

Dealers Prospering, Too

A MAJORITY of automobile dealers as well as manufacturers have been getting the benefit of 1926 prosperity, rumors to the contrary notwithstanding. Ask any business man about his troubles and he always will have a number to tell you of; everybody has. But the story of prosperity is written in net profits. Net profits are prosperity; lack of net profits is depression.

A few days ago *Automobile Trade Journal* got letters from several hundred dealers for twenty different makes of cars and scattered all over the country. These letters showed that 60 per cent of this representative group made greater net profits the first half of this year than in the first half of 1925; 36 per cent made less; 4 per cent were about equal.

Some dealers can be expected to lose money under any set of merchandising or economic conditions, whether they are automobiles, sewing machines or grocery dealers. Several per cent of those who have fallen down must be in this class.

The rest of those who have not done so well are bunched pretty much in a relatively small group of cars. A few factories have pushed their retailers rather hard, have been somewhat rigid in merchandising policies and have kept their own profits up at the expense of some of their field organization. A few car builders haven't participated in the increased prosperity themselves to any great extent.

But dealers in a huge majority of lines this year have shared fully in the prosperity which has come to the industry in general because of favorable economic conditions, improved selling methods, more sensible handling of used car problems and increased understanding between dealers and manufacturers.

Flange-Mounting of Flywheels

THE crankshafts of all automobile engines—with the exception of the few that are equipped with ball bearings—are forged with an integral flange at the rear or driving end, to which the flywheel is bolted. This method of flywheel mounting has become a tradition in the industry, but conditions have greatly changed since it was first introduced.

The first motor car engines had the flywheel keyed to the crankshaft, the same as stationary engines, but a good deal of trouble was experienced from the keys coming loose. At that time large cylinders were employed, while the diameters of the crankshafts were comparatively small. Moreover, the engine had only one or two cylinders, so the impulses were separated by an interval and did not overlap. Two cylinder opposed engines with 5 by 6 in. cylinders had only a 2 in. crankshaft. Today crankshafts of the

same diameter are used with engines of 3 by 4 or 3 by 4½ in. cylinders, and these engines have six and eight cylinders, so that the torque fluctuations are comparatively small. The maximum instantaneous torque on the crankshaft at low speed is about four times as great in the former case as in the latter. There is no question that the flywheels used with these engines could be mounted on the crankshafts sufficiently securely by keying, and whether or not keying would be better than the present method of flange-bolting depends upon other considerations.

First of these is that of relative costs. If no flange needs to be forged on the crankshaft the forging evidently will be somewhat cheaper, and it seems reasonable to assume that the cutting of keyways and the fitting of keys is less expensive than the drilling of bolt holes in both the crankshaft flange and flywheel web and the fitting and locking of the necessary bolts. The flywheel hub, of course, must be fitted to a taper seat and be drawn up onto this seat by a nut on the end of the crankshaft, and the cutting of the thread on the crankshaft and other work connected with this method may make it just as expensive as the one now used.

The other point to be taken into account is, that a keyed flywheel must have a hub of considerable length, and this might make it necessary to increase the over-all length of the powerplant, which certainly would be undesirable.

Hot Weather Thoughts

WHO wants things to think about during these summer hot spells? There are lots of questions which require planning and forethought and which ought to be given attention during the summer, if fall and winter accomplishments are to be what they should. In the list of things to think about after getting planted comfortably across a desk from an electric fan, the following might be included:

The 1927 Automobile Shows: How to liven up exhibits at national shows, how to train the sales force for work in the exhibit, development of ideas for passing on to dealers for local shows, etc.

Stimulation of winter business: Christmas selling campaigns, ways to keep dealer stocks moving in winter, etc.

Conventions: Does your organization get the most out of the various technical and business conventions which its men attend? Do too many men go and waste time or do too few go and let opportunities for gaining information and contacts slip by? Can the 1926-27 convention season be used more efficiently than past convention seasons?

AUTOMOTIVE **NEWS SECTION** INDUSTRIES

Philadelphia, Pennsylvania

Thursday, July 29, 1926

Production Continues High, Retail Sales Lower Stocks

PHILADELPHIA, July 29—Total production of passenger cars and trucks in July will run approximately 10 to 15 per cent lower than in June. This rate will compare with the best production ever achieved in this month and is regarded as especially high considering the season and the numerous manufacturing changes under way at factories. August production is expected to maintain about the same general pace as July though increases will be made by individual manufacturers as work on new models is speeded up.

The retail situation throughout the country is continuing brisk, with a large amount of interest being shown especially in the lower priced offerings. The Ford reduction has resulted in a considerable stimulation in recent weeks in many districts, particularly in agricultural regions, where fine early crop conditions are developing good automotive buying. Other low priced cars are meeting a steady and, in some instances a growing, run of business.

Under the stimulus of extremely hot weather, the demand for used cars has increased considerably and a much accelerated rate of movement is noted. Dealers will go into August with used car stocks generally lower. Continuance of the reduced rate of new car production this month will afford dealers further opportunity to reduce used car inventories, promising a satisfactory condition as the fall season opens.

Export buying is continuing in excellent proportions and is showing steady increase. Export business of the Ford company has gone far to maintain its high production rate in the face of reduced business in the United States. Other automobile companies are increasing their export shipments as credit conditions improve. There is an increasing number of distribution outlets, many important new dealers being signed. Development of gasoline substitutes in a number of countries is resulting in increased use of motor trucks and buses, with consequent increased shipments of these from the United States.

Federal Half Equals Year

DETROIT, July 29—Profit of Federal Motor Truck Co. for the first six months of the year is reported as \$1,299,573 before Federal taxes. This compares with \$1,234,799, before Federal taxes, for the entire year 1925.

Ayres Now Works Manager

PONTIAC, July 29—Fred W. Ayres has been appointed works manager of the Oakland Motor Car Co., following six months' service as plant analyst. Previously he was vice-president in charge of manufacturing of the Klaxon division of General Motors.

G.M. Net \$93,285,674 in Record 6 Months

NEW YORK, July 28—Net earnings of General Motors Corp. in the first six months of the year aggregated \$93,285,674, its volume of business and earnings in this period being the highest in its history. Earnings in the first half of 1925 were \$50,363,099. In the 1926 period each of the corporation's units established new high records according to A. P. Sloan, Jr., president.

The balance sheet as of June 30, which will be issued shortly, will show cash and marketable securities of about \$195,000,000, Mr. Sloan said. This statement will include the properties acquired by consolidation with Fisher Body Corp. While the earnings applicable to the 40 per cent minority interest in the Fisher corporation outstanding during the first six months were not consolidated with the earnings of General Motors, "it is nevertheless of interest to note," said Mr. Sloan, "that the combined net earnings of the two corporations for this period aggregate \$101,699,954."

"The strength of the corporation and its improved earnings position at this time," Mr. Sloan said, "are due to the influence of several factors. Certain operations which heretofore have not attained their full earning capacity have now come into strong position. Sales of the corporation's products reflected through every operating division show substantial increases in volume. The car divisions show an increase of 56 per cent in retail deliveries over the corresponding period a year ago. The Delco-Light company, reflecting increased sales of Frigidaire, has also contributed materially to the general result, as has the expansion of the operations overseas."

Peerless Earns \$694,336 in Year's Second Quarter

CLEVELAND, July 28—The income of Peerless Motor Car Corp. and subsidiaries for the quarter ended June 30, 1926, totaled \$694,336 after depreciation, Federal charges, etc., equal to \$2.68 a share

on 258,589 shares outstanding, against \$205,802 or 78 cents a share in the preceding quarter and \$327,234 or \$1.43 a share on 228,589 shares in the second quarter of 1925.

Unit sales for the second quarter this year were 4437 compared with 2620 in the first quarter. Sales of 7057 units for the first six months of 1926 compared with 6367 for the entire year 1925.

Net income for the first six months of 1926 totaled \$900,138 or \$3.47 a share. Consolidated balance sheet as of June 30 shows cash and sight drafts totaling \$2,722,783 which with receivables and inventories brought total current assets to \$7,294,142 against total current liabilities of \$1,555,173. The company is entirely out of bank debt and has no bonds or preferred stock outstanding.

Gray Property Sold to Detroit Group

DETROIT, July 29—Real estate, plant and equipment and other assets of the Gray Mfg. Co. have been sold to a group of business men represented by Theodore Bartel, an officer and large stockholder of the original organization. As result of the sale creditors will receive from 30 to 35 cents on the dollar. The purchasers assume the indebtedness of the Gray company to the extent of \$940,000 and also paid \$175,000 in cash.

The sale was negotiated by L. S. Deeley, manager of the adjustment bureau of the Detroit Association of Credit Men, as trustee for all creditors. The amount obtained is regarded as higher than would have resulted from a forced sale in bankruptcy.

No statement has been made as to the intended use of the property by the new purchasers. In recent months the company has been clearing its inventory mainly through manufacture of Gray cars for the export market.

Career of Apperson is Brought to Close

KOKOMO, IND., July 24—The auctioneer's hammer sounded the final knell of the Apperson Automobile Co. here yesterday when three days of sale of buildings, real estate and machinery of the Apperson plant were concluded. Tools, machinery and office equipment, sold in 1400 separate lots, brought a total of \$80,000.

No bids were received for the office building or for any of the factory buildings. Two lots that were bid upon will be retained, according to Robert L. Tudor, receiver, all bids having been rejected. The real estate, it is understood, will be offered at private sale, and if not sold will go to the bondholders.

Railway Testimony Opens I.C.C. Hearing

Desire for Truck-Bus Regulation
Evidenced—Passenger
Car Cuts Rail Travel

CHICAGO, July 28—The effect of bus and truck operation over hard roads that parallel rail lines upon the revenues of the railways was told to the Interstate Commerce Commission here yesterday at the first session of the hearing being conducted by the commission into various aspects of motor vehicle transportation.

It was evident from the testimony of several railroad officials that the railroads would welcome a comprehensive system of Federal regulation of motor transportation insofar as it engages in interstate traffic and an equally comprehensive State regulation of intrastate motor transportation.

In his opening statements, Commissioner John J. Esch, who is presiding, made it plain that the only object of the commission in the present hearings is to determine facts that will serve as the basis of legislation recommendations to be made to Congress. He indicated that the commission recognizes it is without authority to regulate motor transportation until such time as specific legislation to that effect is enacted by Congress.

He stated that the growing volume of motor transport and its apparently serious competition with the common carriers now subject to interstate commerce control, made it important that something be done as soon as possible. He stated that the commission hoped to recommend legislation in time for its enactment at the short session of Congress convening in December.

The hearing in Chicago is to consume three days. The first day the railroads presented their case. The second day is given over to the side of the automotive industry, and the third day is set aside for the representatives of other interests, including the American Farm Bureau Federation and other consuming and shipping organizations.

One Rail Line Abandoned

Yesterday's witnesses included traffic officials of the C. B. & Q. and the C. & A. railroads. P. S. Eustive, for the Burlington, stated that in the case of one short unprofitable line in the Black Hills, the company had abandoned the rails and was using buses to provide transportation, but in no other case was it using buses. He attributed a considerable portion of his company's loss of passenger business to the private automobiles rather than the bus.

George J. Charlton, for the C. & A., told how since 1921 the average number of tickets sold at various small stations along his line between St. Louis and Chicago had decreased more than 50 per cent. He attributed this largely to the bus services operating from town to town along the line. A concrete State highway

virtually parallels the tracks of the C. & A. all the way from Chicago to East St. Louis. Mr. Charlton told how there are now four or five interstate bus lines operating over this highway between Chicago and St. Louis.

Representatives of electric lines in Illinois and Indiana told how they had inaugurated bus lines to supplement their rail services and to keep out or meet bus competition of independent operators.

Moving Men Object to Long Truck Terms

NEW YORK, July 26—Resolutions directed against the selling of motor trucks on long term payment plans to movers of household goods were passed at the annual meeting of the National Furniture & Warehousemen's Association at Mackinac Island this month. The resolutions urged careful investigation of credit risks and held that terms of sale should include down payments of at least 20 per cent and the payment of the balance over a period not exceeding 18 months.

Failure to observe these principles, it was declared, tended to demoralize the warehousing industry and to cause the public to suffer through poor service.

The warehousemen voted to participate in the Interstate Commerce Commission truck and bus hearings. The position of the association is that warehousemen are performing a specialized private transportation service and should not be subject to regulation as common carriers.

Custom-Built Brougham Introduced by Gardner

ST. LOUIS, July 29—A new custom-built, four-door brougham model on both the Gardner six and the eight-cylinder chassis has just been announced. On the former chassis the list price is \$1645 and on the latter \$1995.

The new body was designed by Lubitz, a custom builder, and Gardner engineers working in collaboration. The exterior of the body is done in Ambato green with disk wheels in the same color. A lighter shade of green is used on the panel between the belt moldings.

C. C. C. Earnings \$440,569

NEW YORK, July 28—The Commercial Credit Corp. reports net earnings after interest and discount charges for the first six months of 1926 as \$440,569. Purchases of time sales, notes, and other obligations for six months totaled \$36,891,049. There are as of June 30, in the company's possession, repossessed cars having an appraised value of \$91,948.

Timken Profit \$1,223,069

DETROIT, July 29—Net profit of the Timken-Detroit Axle Co. for the six months ended June 30 was \$1,223,069 after charges, equivalent after allowing for dividends on the 7 per cent stock, to \$1.29 on the 827,345 shares of outstanding common stock. This compares with \$678,700, or 63 cents a share on 823,920 shares in the first half of 1925.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co., second largest bank in America.

NEW YORK, July 29—Trade continued in good volume last week, despite the fact that seasonal factors tend to produce dullness at this time of year. Nearly the entire country was in the grip of a heat wave, which apparently stimulated business in some lines and retarded it in others. The effects on the crops were also irregular. Commodity prices in general declined rather sharply, while stock prices continued to advance in active trading. Shares sold on the New York Stock Exchange numbered 8,822,700, as against 6,917,606 in the corresponding week last year.

The yield of winter wheat is reported to be far above earlier expectations. Primary receipts from July 1 to July 25 totaled nearly 49,000,000 bushels, or 20,000,000 bushels more than a year ago.

CAR LOADINGS

Car loadings in the week ended July 10 (a holiday week) numbered 900,997, as against 1,072,624 in the preceding week and 986,893 in the corresponding week last year, which contained no holiday. Loadings for the year to date total 27,010,085 cars, as against 26,181,582 cars a year ago.

OIL PRODUCTION

Crude oil production increased sharply during the week ended July 17, the average daily output being 2,054,400 barrels, as compared with 2,032,650 barrels in the preceding week and 2,115,150 barrels a year earlier. No general change in crude oil or gasoline prices occurred last week.

BANK DEBITS

Bank debits to individual accounts reported to the Federal Reserve Board for the week ended July 21 were approximately equal to those a week earlier and were 8.6 per cent larger than those of a year ago.

FISHER'S INDEX

Fisher's index of wholesale commodity prices last week stood at 149, the lowest point reached so far this year.

A week earlier the index stood at 150.2, and four weeks earlier it was 152. The wholesale price index of the Bureau of Labor Statistics advanced further last month to 152.3, as against 151.7 in May and 157.4 in June, 1925.

FEDERAL RESERVE STATEMENT

Bills and securities held by the Federal Reserve banks declined \$44,400,000 during the week ended July 21, with decreases of \$19,500,000 in discounts, \$16,800,000 in open market purchases and \$8,000,000 in Government securities. Note circulation declined \$26,300,000, deposits \$32,600,000 and reserves \$2,000,000. The reserve ratio advanced from 74.9 to 76.0 per cent.

Loans of reporting member banks declined \$27,000,000 during the same period, while investments increased \$10,000,000.

Detroit Sets Plans for I. C. C. Meeting

Names Local Committees to Care for Interests in Bus- Truck Investigation

DETROIT, July 26—The National Automobile Chamber of Commerce sponsored a luncheon at Book Cadillac hotel attended by representatives of various civic organizations, manufacturers, bus and truck operators, to discuss the hearing which the Interstate Commerce Commission will hold in Detroit, Sept. 1, as a part of its nation-wide investigation of truck and bus transportation.

The Interstate Commerce Commission, said Edward F. Loomis, secretary of the motor truck committee of the N. A. C. C., desires to study motor practice, but since it has no authority to compel appearances except on the part of the rail lines, motor users must testify voluntarily if they want to be heard.

The American Automobile Association is taking a vital interest in the hearings, said Thomas P. Henry, president, who declared that his organization will be represented at each of the 13 hearings to be held in various parts of the country.

A committee of five has been appointed by the Michigan Motor Bus Association, and an attorney retained to protect their interests at the hearing, George P. McCallum, president, declared. Mr. McCallum said the motor bus business has reached a point where it is stabilizing itself and declared there is a need for all facts about transportation being brought out.

According to L. G. Macomber, director of traffic-transportation of the Detroit Board of Commerce, that organization is manifesting considerable activity in preparation for the hearing. Questionnaires dealing with motor transportation are being sent to each of the several thousand members, and this data will be compiled and placed before the commission. The Board of Commerce, he said, considers the investigation one of the most important that it has ever taken a part in.

Outlines Plan of Hearing

The manner in which testimony will be taken at the hearing was explained by Attorney Frederick M. Dolan, of the law firm of Judge C. C. McChord, formerly a member of the I. C. C., and counsel for the N.A.A.C.C. in this investigation.

Arthur T. Waterfall, vice-president of Dodge Brothers, Inc., and a member of the special committee which has been appointed by the N.A.A.C.C. to cooperate with the different groups on behalf of the motor users, presided. At the conclusion of the meeting he said a delegation from Detroit would go to Chicago for the opening hearing of the I.C.C., Tuesday, and, upon its conclusion would return to Detroit to consider various phases of the question after which another meeting, similar to today's would be called to more fully discuss the situation.

John J. O'Neill, represented the Motor Truck Operators Association, which was recently formed in Detroit; H. H. Hardy, the Michigan Furniture Warehousemen's Association. Howard D. Brown, counsel for the Detroit Automobile Club and Ernest M. Smith, of Washington, general manager of the American Automobile Association, were present.

Williams Confirms Small Marmon Near

INDIANAPOLIS, July 26—Rumors concerning the introduction of a new and smaller Marmon as a companion to the Model 74 have been confirmed in a statement signed by G. M. Williams, president of the Marmon Motor Car Co.

According to Mr. Williams, "the design of the small car, both from the standpoint of engineering and body architecture will reflect the studies made over a long period in Europe and in this country by Marmon engineers. Its characteristics have been determined with a view to the vast changes which have occurred in our urban traffic and parking conditions. While fully capitalizing the best European ideas and adapting them to American conditions, its engine has been designed and built solely from the American point of view as to power, speed and stamina."

Oil Substitution Shown by Ohio Investigation

CLEVELAND, July 26—Following a survey of local oil stations, the Cleveland Better Business Bureau declares that one-fourth of the independent companies here are substituting inferior motor oils for standard grades. Dale Brown, manager of the bureau, states that the investigation is being conducted throughout Ohio and that at the end of three weeks, when the inspection will have been completed, there will be prosecutions on the charge of obtaining money under false pretenses.

Although the 25 per cent represents a small portion of a small group, Mr. Brown says that motorists are losing \$75,000 a year through oil substitution. He says that some dealers have bought drums of standard oil from jobbers and, after the contents were sold, refilled the drums with inferior grades.

Add to Graham Plant

EVANSVILLE, July 26—The M. J. Hoffman Construction Co. of this city has begun construction of a concrete, brick and steel building addition to the power plant department of Graham Brothers truck plant. The structure which is being built to take care of larger production schedule will cost, with equipment, about \$100,000, it was said.

It supplements the building erected last year, which was said to be the finest power plant in this section of the country. Equipment of the new addition will include several improvements in the boiler room.

"Big Tim" Gets Order to "Lay Off" Dealers

Must Not Interfere With Chi- cago Association, Court Rules —Continues as Member

CHICAGO, July 24—Under an order issued by Circuit Judge Ryner, Timothy D. (Big Tim) Murphy, of labor notoriety, is enjoined from assuming the executive burdens of the Chicago Tire Dealers Association or participating "in any acts that would tend to interfere with the business of the organization."

The action of the court followed exciting political disturbances in the tire dealers' association wherein Murphy, as the central figure, had set himself up as president. It was Murphy's first public activity since his recent release from the Leavenworth prison where he served a term for participation in the Dearborn station mail robbery here.

Murphy made no effort to defend his claims before Judge Ryner, meeting the court's decision with an announcement that he had resigned his "office" two days previously and that therefore the injunction was without material significance as far as he was concerned.

It was charged that Murphy brought about his election to the association presidency at a secret meeting of his followers without giving the full organization an opportunity to vote on the matter. Use of the association's official stationery is what eventually brought the protesting group into court. While under an injunction which prohibits interference with association affairs Murphy remains a member.

New Chromium Corporation to Produce for Industry

CLEVELAND, July 26—John T. Pratt, president of the Chemical Treatment Co., announces the organization of the Chromium Corp. of America to take over patents of the Chromium plating process developed by the Chemical Treatment Co. and the Chromium Products Corp., a subsidiary of the Metal & Thermit Corp. Mr. Pratt will be chairman of the new corporation.

The company plans a national service and will establish plants in Cleveland and Akron with branch offices in the principal cities. The company will produce chromium plate for manufacturers of brake drums, automobile radiators, steel tubing and automobile accessories.

Fisk Adds to Plant

MILWAUKEE, July 24—Work is being pushed by the Fisk Rubber Co. on a large addition to its Milwaukee plant, known as the Federal Rubber Co. division, and located in Cudahy, a suburb of Milwaukee. The building will be six stories high, 66 x 286 ft., and is an extension to the main factory. The work is under the direction of G. P. Allen, Fisk engineer, New York. George J. Mead is chief plant layout engineer at Cudahy.

New Type of Plane Perfected on Coast

Has Tilting Wings to Change
Altitudes—Claimed to Land
at Slow Speeds

LOS ANGELES, July 26—A new type of airplane which it is claimed will greatly enhance the safety of flying has been perfected by Prof. Albert A. Merrill, head of the department of aeronautics of the California Institute of Technology. A device perfected by Professor Merrill, who enjoys an eminent standing in aeronautical research work, allows the entire wings to be tilted up or down to aid or retard the force of gravity, as opposed to the present practice of using a tail elevator to change altitude. The claims made for the new plane, it is declared, have been definitely proven in severe tests, which were designed to establish that with the new device accidental tail spins and nose dives could be eliminated.

Another feature which adds to the safety of the Merrill type of plane is that this ship is reported to land while slowed down to a pace of 25 miles an hour and come to a stop within 50 to 100 feet. The type of plane now used by the United States army must be traveling at nearly 60 miles an hour to make a successful landing, and consequently requires a large landing space.

The raising or lowering of the wings in the Merrill planes is done by means of a steering wheel on the side of the fuselage. The craft is capable of making a speed of 85 miles an hour.

German Air Lines Expand to Four Times 1924 Size

WASHINGTON, July 28—Commercial aviation in Germany in 1925 quadrupled that of 1924, says a report of the German Federal Ministry of Transportation just forwarded to the Department of State by the American consul at Berlin. Never in the history of aviation have the Germans taken such interest as they are at the present time the report states.

There were two lines in 1924, touching 26 cities. In 1925 there were 56 lines touching 61 cities. In 1925 there were 107,544 passenger seats available as against 24,613 available in 1924. The German public used 13,422, or 54.5 per cent of the available space in 1924 and during 1925 they occupied 55,185, or 51.3 per cent of the seats available.

This increased interest and use of commercial aviation, is explained in part by the fact that the German government grants a subsidy for the various routes.

Columbia Moves Branch

MILWAUKEE, July 28—The Milwaukee branch of the Columbia Tool Steel Co. has been moved to larger quarters at 109-111 Reed Street, where it will maintain larger stocks and also have more complete equipment.

CANADIAN BUSINESS SHOWS SHARP GAIN

TORONTO, July 26—Shipments of cars and trucks from the Toronto factory of Dodge Brothers, (Canada), Ltd., to Canadian points for the first six months of 1926 show an increase of 81 per cent over the same period of last year, and a gain of 36 per cent over the entire year of 1925. Shipments for June alone show an increase of 166 per cent over June, 1925.

The automobile industry in Canada is showing a most remarkable record which is understood to be due to the lowered tariff with the United States. Sales to date have exceeded those of any previous twelve months.

New Cadillac Prices Show Slight Change

DETROIT, July 29—Prices on all models of the Cadillac standard line have been increased by amounts ranging from \$55 to \$100 with the exception of the five-passenger brougham which remains at \$2995. Prices on the custom-built line have been decreased on the closed models and increased on the open types. The complete price schedule follows:

	Standard	New	Old
5-pass. brougham	\$2995	\$2995	
2-pass. coupe	3100	3045	
5-pass. sedan	3250	3195	
7-pass. sedan	3350	3295	
7-pass. imperial	3535	3435	
4-pass. victoria	3195	3095	
5-pass. sport sedan	3650	....
Custom-built			
7-pass. touring	\$3450	\$3250	
5-pass. phaeton	3450	3250	
2-pass. roadster (132-in. Wb.)	3350	3250	
5-pass. coupe	3855	4000	
5-pass. sedan	3995	4150	
7-pass. suburban	4125	4285	
7-pass. imperial suburban..	4350	4485	
Convertible coupe	3450	....
Sport phaeton	3975	....

Set Hinkley Auction Date

DETROIT, July 27—All machinery, tools and factory equipment of Hinkley Motors, Inc., will be sold at auction Aug. 17 and 18 at the plant in Ecorse, near Detroit. The sale will be conducted by the Industrial Plants Corp. of New York. The Hinkley company has specialized in the manufacture of heavy duty engines for trucks, and also has made a replacement engine for Ford trucks.

Mueller Opens Offices

PORT HURON, July 26—To provide for increasing business in Ohio and southeastern Michigan, Mueller Brass Co., this city, has established two new offices in charge of direct factory representatives. These offices are at Dayton and at Flint, the former in charge of P. L. Craft and the latter in charge of G. A. Reamer. The company is a large producer of brass, bronze, copper and nickel silver alloy products.

Kanzler Named for Special Ford Work

Resigns as Vice-President of
Company—Specialized in As-
sembly Plant Operation

DETROIT, July 27—E. C. Kanzler has resigned as second vice-president of Ford Motor Co. to devote his time in the future to personal work for Henry and Edsel Ford. Mr. Kanzler is a brother-in-law of Edsel Ford. No announcement was made as to the nature of the new work Mr. Kanzler will undertake, but Edsel Ford in a statement said it was work for which Mr. Kanzler's experience has especially equipped him.

Mr. Kanzler as second vice-president of the Ford company was one of the few titled officers of the organization. He has had an important part in the development of the Ford production program which included especially the locating and building up of assembly plants both here and abroad. In a production sense Mr. Kanzler ranked second to P. E. Martin, first vice-president. He also is a director of Ford Motor Co. of Canada, Ltd.

Edsel Ford has left for his summer home in Maine where he will spend several weeks. On his way east it is understood he will stop off to visit President Coolidge at his Adirondack camp. There he will discuss with the president the immediate outlook for commercial aviation development and, according to report, may discuss informally the possibility of reopening negotiations for the taking over of Muscle Shoals.

Henry Ford will celebrate his sixty-third birthday this week.

Elcar Landau Roadsters List at \$1675 and \$2295

ELKHART, IND., July 26—A new landau roadster with convertible top on both the six and eight-cylinder chassis has been added to the Elcar line by the Elcar Motor Co. The six-cylinder model lists at \$1675 and the eight-cylinder model at \$2295.

Equipped with a rumble seat, this roadster is capable of carrying five passengers. The car may be converted into a closed coupe in 10 seconds by raising the top and sliding the glass windows up out of the door panels.

With the introduction of this new model, the Elcar company has discontinued the three-passenger open roadster on the eight-cylinder chassis.

Citroen Prices Reduced

WASHINGTON, July 29—A cable from Switzerland advises the Automotive Division of the Department of Commerce that effective June 5, pronounced reductions in the prices of Citroen cars were announced. Prices now range from \$878 for the 4-seater standard Torpedo to \$1042 for the Normande model. These reductions varied from \$19 to \$115.

Demand for Steels Encourages Makers

Movement to Higher Price Levels Regarded as Possi- bility of Steady Buying

NEW YORK, July 29—While in all probability weather conditions have cut more deeply into steel output than into steel consumption, rolling mill operating schedules can be easily adjusted to make up for what gap in production has been caused by the hot weather. There is every indication that automotive demand for sheets, strip steel, cold-finished bars and alloy steels continues at a pace that, if not spectacular, is certainly encouraging to producers. The market for full-finished automobile sheets leads in firmness, and sales managers intimate that every week brings nearer the long-hoped for moment when resistance to a modest upward readjustment of prices will be overcome.

Hope of a recession in sheet bar prices has lessened, and there is a steadily growing number of automotive consumers who are more than exacting in the matter of uniform quality. In the steel industry itself, there continues much divergency of opinion as to the outlook. There are those who timidly suggest that the relatively high rate at which mills are operating at present may be followed by a dip in the demand later in the year or at least by not so great a demand during the fourth quarter as ordinarily could be expected.

Others believe that all looks well, and that, having weathered July in so satisfactory a manner, nothing but improvement can be looked for from now on. Some mills have backed this faith by heavy commitments for raw materials, while others appear to be going slow. In the steel scrap market, looked upon in many quarters as an unfailing barometer for the steel industry, the purchasing agents for the steel mills have locked horns with the large scrap brokerage interests. The latter talk higher prices, and the former counter by saying that the market is too high as it is.

Certain it is that, with basic pig iron quoted at \$17.50, Valley, the \$17 asked price for heavy melting steel scrap, Pittsburgh, seems high, but, strange as it may seem, scrap iron prices are but little influenced by the market for the virgin metal.

Pig Iron—Automotive foundries are apparently well covered. The market rules quiet. Blast furnaces have sufficient low-priced business on their books to keep them going for some time.

Aluminum—The aluminum market is marking time. Speculation is rife as to the effect on the market of the greater world supply that may be expected from the operation of the domestic producer's new Canadian properties. German reports indicate that the Lauter Works will

INCREASES PLANNED ON STEEL SHEETS

YOUNGSTOWN, July 27—Makers of full finished automobile sheets used in body and fender manufacture are planning a \$2 per ton increase, from \$4.20 to \$4.30 per 100 lb., effective Aug. 1. Another \$2 per ton advance, effective for Sept. 1, is also planned, to bring the price to \$4.40. Makers say the present market of \$4.20 is too low to permit a reasonable margin of profit. The principal producer in this district is the Newton Steel Co., operating a plant at Newton Falls, Trumbull county.

become more and more of a market factor. It has acquired bauxite mines in Hungary and elsewhere, and its present production costs are believed to be even lower than those of Norway. Fair demand for No. 12 alloy is noted.

Copper—Good forward business has been done at 14¼ cents, delivered. Consumers dispute the contention of the producers that formation of an export combine would not affect domestic prices. Demand for automotive brass is fair.

Tin—Consuming demand is light.

Lead—Recent price changes were solely due to the metal's position in London. Far from being large, the supply in sight is believed to be sufficient for all consuming needs, but some producers have no metal to offer.

Steel Mill Operations Hold High Summer Rate

CLEVELAND, July 26—Because steel is once more moving to the automobile plants in this section in increasing quantities, steel mill operations in the Youngstown district are exceeding all records for the summer season with the exception of World War years. The increasing demand from automobile manufacturers is attributed to a desire to place new models on the market earlier than usual this season.

Distributors and dealers are meeting with no unusual slump in the sale of motor cars and the factories are expecting earlier demands for fall than usual.

The Youngstown steel mills have just started new schedules and are now running at an average of 85 to 90 per cent. Independent steel making is now at the rate of 85 per cent with 44 of the 53 open hearth furnaces of the district in operation.

Youngstown Mills Increase

CLEVELAND, July 26—The Youngstown steel mills which last week broke all summer production records, except for the war period, opened the week with an even higher production rate. Mills are now at between 85 and 90 per cent of capacity. Forty-seven of 53 open hearth furnaces are now in operation as compared with 44 last week.

Lumber Association Says Wood Quieter

Cites Bureau of Standards Tests to Proclaim Superiority of Types

WASHINGTON, July 29—Using the argument that wood automobile bodies deaden motor noises, the National Lumber Manufacturers Association, with headquarters here, has launched a campaign to convince the trade and the public of the superiority of automobile body materials furnished by its members.

The association cites recent tests conducted at the U. S. Bureau of Standards which it declares showed that cars with closed bodies which are framed with wood, shut off from the occupants more than 99 per cent of noise originating in the motor and transmission and from contact with the road which is transmitted by the steel frame.

It is further argued in the statement that bodies in which the metal surface is attached to a steel framework let more than 100 times as much noise through to the passengers. The more rigid the connection between chassis and the material which forms the interior finish of the car the more easily sound is transmitted.

In conclusion it is stated that the Bureau of Standards found that partitions made with wood framing and covered with lath and plaster transmit less than one-hundredth as much sound as those of lath and plaster with metal framing.

Stephenson Takes Plant to Make Hood Protectors

BUFFALO, July 27—The Stephenson Protectahood Corp. of Auburn, has perfected its automobile hood lining and will open a manufacturing plant in part of the present Plant No. 4 of the International Harvester Co., Auburn.

The officers and directors of the corporation are Lester B. Sawyer, president; Stanley Metcalf, vice-president; George C. Pearson, treasurer, and C. D. Osborne, secretary.

The Stephenson Protectahood is made from reinforced felt combined with a heavy layer of asbestos, each section being bound with strong tape. The felt side is placed next to the hood and it is claimed by the manufacturer that through it there is no noise of rattling, squawking or chafing. It is claimed that it prevents overheating of the motor in hot weather, and maintains warmth during cold weather.

P. S. Gets Bus Purchase Money

TRENTON, N. J., July 26—Execution of \$2,900,000 mortgage notes by the Public Service Transportation Co. to be used in paying for 333 gas-electric buses has been approved by the Public Utilities Commission.

Exports, Imports and Reimports of the Automotive Industry for June of current year and total for twelve months ending June, 1926

	Month of June		EXPORTS		Twelve Months Ending June	
	1925	1926	1925	1926	1925	1926
	Number	Value	Number	Value	Number	Value
Automobiles, parts and accessories (total)...	20	24,829,063	..	22,373,056	145	255,312,341
Electric trucks and passenger cars.....	20	23,082	..	..	86	331,928,035
Motor trucks and buses, except electric:						140,952
Up to 1 ton, inclusive.....	..	..	..	..	9,403	3,847,905
Up to \$800, inclusive.....	2,204	756,929	3,355	1,473,186	16,597	6,024,237
Value over \$800.....	131	157,539	118	125,557	1,495	1,615,886
Over 1 and up to 2½ tons.....	635	841,343	903	1,171,050	7,051	9,240,216
Over 2½ tons.....	125	363,665	204	623,398	1,529	4,226,523
Total motor trucks and buses, except electric	3,095	2,128,476	4,508	3,393,191	36,075	24,954,767
PASSENGER CARS						
Passenger cars, except electric:						
Value up to \$500, inclusive.....	5,731	2,061,982	5,466	2,107,599	71,957	26,127,127
Value over \$500 up to \$800.....	5,154	3,687,296	4,785	3,191,137	49,355	34,970,744
Value over \$800 up to \$2,000.....	..	..	..	..	22,761	26,749,809
Value over \$2,000 up to \$1,200.....	4,001	4,178,983	3,702	3,815,028	29,346	30,704,548
Value over \$1,200 up to \$2,000.....	1,813	2,745,908	945	1,423,072	11,300	16,807,566
Value over \$2,000.....	614	1,609,622	456	1,229,655	4,538	12,501,894
Total passenger cars, except electric.....	17,313	14,283,791	15,354	11,816,491	189,257	147,861,688
PARTS, ETC.						
Parts, except engines and tires for automobile						
unit assemblies.....	..	3,902,788	..	2,561,564	..	38,939,266
Automobile parts for replacement.....	..	2,229,375	..	2,759,260	..	24,234,152
Automobile accessories.....	..	771,863	..	792,366	..	7,299,038
Automobile service appliances (n.e.s.).....	..	457,531	..	676,067	..	3,928,500
Station and warehouse motor trucks.....	32	22,552	29	34,259	272	179,604
Trailers.....	29	11,709	30	17,192	627	229,149
Airplanes.....	6	37,800	15	81,503	70	363,956
Parts of airplanes, except engines and tires	..	1,461	..	12,915	..	119,751
BICYCLES, ETC.						
Bicycles and tricycles.....	468	14,133	422	12,452	7,705	195,068
Motorcycles.....	1,730	403,328	1,591	343,591	19,531	4,451,097
Parts, except tires.....	..	165,978	..	105,315	..	1,558,192
INTERNAL COMBUSTION ENGINES						
Stationary and portable:						
Diesel and Semi-Diesel.....	19	38,596	78	66,832	786	487,818
Other stationary and portable:						
Not over 10 H.P.....	1,950	149,598	2,687	248,331	28,040	2,590,494
Over 10 H.P.....	82	119,593	149	189,309	2,031	1,868,067
Automobile engines for:						
Motor trucks and buses.....	7,655	553,652	49	22,900	34,687	2,954,867
Passenger cars.....	8,986	936,036	10,477	1,027,284	76,039	8,862,148
Tractors.....	48	33,253	168	56,568	2,308	777,774
Aircraft.....	2	6,320	30	93,843	58	116,240
Accessories.....	..	423,587	..	372,779	..	3,626,530
IMPORTS						
Automobiles and chassis (dutiable).....	60	94,134	54	102,092	562	934,940
Other vehicles and parts for them (dutiable)	..	67,167	..	14,711	..	731,333
REIMPORTS						
Automobiles (free from duty).....	10	12,238	34	45,287	465	676,743

Car Exports Reach \$374,000,000 in 1925

WASHINGTON, July 29—The year 1925 is credited with being a record one for the American automotive industry when a greater number of automobiles were produced and a much greater number exported than in any preceding year, in the official Department of Commerce Yearbook for 1925, just made public here.

It is set forth that production of passenger cars, trucks and buses amounted to 4,314,746 units, an increase of almost 220,000 units, or 5 per cent over the record of 1923. The value of all automotive products exported from the United States and Canada was approximately \$374,000,000, an increase of 48 per cent over the preceding year.

"Exports of cars and trucks (complete or chassis but not counting the very large number of 'assemblies')," continues the summary of the automotive industry, "from the two countries, excluding exports from one to the other, numbered 361,291, over 60 per cent more than in 1924; the proportion of total production exported was greater than in any other year.

"Other features of the year were: Price reductions on practically all makes and models, the great increase in closed-car production and sales, and the gains in motorcycle and aircraft production and exports over 1924.

"The number of cars and trucks regis-

tered reached very nearly 20,000,000 in 1925, an increase of 13 per cent as compared with 1924."

Poland Favors Czech Cars in New Commerce Treaty

WASHINGTON, July 29—A supplementary commercial treaty between Czechoslovakia and Poland was concluded on April 21, effective May 1, the Automotive Division of the Commerce Department is advised through consular dispatches. The treaty provides for import contingents for Czech automobiles imported into Poland.

The dispatches add that a new motor cycle of domestic manufacture in Czechoslovakia, to be called the "B. D." will shortly be introduced in the market. It is produced by Breitfeld, Danek & Co., the estimated production is 2000 per year and will sell for approximately 13,000 Czechoslovak crowns, or \$390.

Cuban Market Declines

WASHINGTON, July 29—The automotive market in Cuba continued to decline during the second quarter of this year due to the extended depression which retarded Cuban business in general according to a report to the Automotive Division of the Department of Commerce from Trade Commissioner O. R. Strackbein, Havana. Due to delayed deliveries in May because of a railway strike the eastern half of the island has had few sales during the month of June.

British Registration Gains 5% in Year

WASHINGTON, July 29—An increase of approximately 5 per cent in the private passenger car registration in Great Britain, as of May 31, and a registration on that date of two and a half times as many as on May 31, 1921, and near six times as high as in 1913, is reported to the U. S. Department of Commerce by the British Ministry of Transportation.

The registrations reported since 1913 were as follows: 1913, 209,000; 1921, 243,000; 1922, 315,000; 1923, 384,000; 1924, 474,000; 1925, 580,000; 1926, 627,000. Registration of commercial cars on May 31, 1926, was 335,000, compared with 323,000 on May 31, 1925.

During the six months ending May 31, a total of £7,548,866 was collected from car users of Great Britain in taxes.

Germany Buys Light Trucks

WASHINGTON, July 28—American manufacturers of light trucks and road building machinery have a fertile potential field in Germany, according to report just made to the Department of Commerce by Theodore Pilger, trade commissioner at Berlin. Germany, he says, is rapidly increasing its mileage of good roads with finances furnished by both State and Federal governments. There is a good demand for light American automobile trucks, but because of extremely high tariff, there is relatively little market for heavy trucks, he reports.

Central Alloy Steel Joins Big Companies

Assets of New Corporation Exceed \$80,000,000—Is Large Automotive Producer

CANTON, OHIO, July 24—Announcement of the merger of the Central Steel Co. and the United Alloy Steel Corp., under the name of the Central Alloy Steel Corp., was made by Otis & Co. this week. The merger will be effected through exchange of stock on the basis of 2½ shares of United Alloy Common stock for one share of Central. Officers will be F. J. Griffiths, chairman of the board; C. E. Stuart, president and treasurer; B. F. Fairless, vice-president and general manager; J. H. Schlendorf, vice-president in charge of sales, and Charles W. Kreig, secretary.

Mr. Griffiths announced no radical changes would take place but that every effort would be made to cement and build up in these two companies an organization unexcelled in the industry.

The United Alloy Steel Corp. plant is located in Canton and includes a blast furnace and coke plant, open hearth furnaces, blooming mills, plate and bar mills, sheet rolling mills, jobbing mills and a fabricating and galvanizing division. A general line of steel products is manufactured, operations including everything from the manufacture of pig iron to the sale of finished products.

The plant of the Central Steel Co. is located at Massillon and consists of open hearth furnaces, blooming mills, plate and bar mills, sheet rolling mills and strip mills. Its products include high grade open hearth alloy steels, automobile sheets and strip. A new blast furnace and by-products coke plant now under construction is expected to be ready some time in August and will aid materially in rounding out the company's activities.

The combined assets as shown by balance sheets of Dec. 31, 1925, are in excess of \$80,000,000 and combined net earnings after Federal taxes for the year 1925 were more than \$6,500,000.

Two United Officers Resign

CANTON, OHIO, July 24—First changes in the personnel of the United Alloy Steel Corp., now known as the Central Alloy Steel Corp., as a result of a merger between the United Alloy of Canton and the Central Steel Co. of Massillon, were announced Friday. George H. Charls, president of the United Alloy Steel Corp. and H. H. Pleasance, vice-president and director of sales, have tendered their resignations, effective immediately. Both have been accepted.

Mr. Pleasance became associated with the United Alloy as director of sales during 1923 and has served in that capacity since that time. After Sept. 1 he will be associated with the Bourne-Fuller Co. of Cleveland.

CHEVROLET STAGES 4½ MILE DRIVEAWAY

FLINT, July 22—More than 800 Chevrolet dealers, associates and salesmen came to Flint, today, for the annual convention of the Flint regional sales territory, which was featured by a parade of new Chevrolets 4½ miles in length and field day exercises at Lakeside Park.

The parade was formed at the factory in the morning, and consisted of cars which the various dealers were going to drive home. It moved through the downtown district to the park, where dinner was served in the pavilion at noon. Following speeches, an athletic program was held.

Speakers were A. F. Young, regional sales manager, Flint; C. E. Dawson, assistant general sales manager, Chevrolet Motor Co.; C. L. Garner, sales manager, Flint zone, and H. O. Winn, sales manager of the Cleveland zone.

India Car Imports Mount, Canada and U. S. in Lead

WASHINGTON, July 26—In the year ended March 31, 1926, value of automobiles imported into India amounted to Rs.282 lakhs against Rs.220 lakhs in the previous year. The total number of units imported increased from 9380 in 1924-25 to 12,757 in 1925-26.

The number of United States cars imported increased from 3106 to 4143; of Canadian, from 3956 to 4775; of British, from 1682 to 2399; of Italian, from 235 to 960; and of French, from 160 to 367. Whilst the average price of American automobiles declined from Rs.1900 to Rs.1800, the British average price declined from Rs.3600 to Rs.3200.

Canadian Car and Truck Exports Show June Drop

TORONTO, July 26—Exports of automobiles from Canada totalled 2,979 in June, against 3,977 in May and 4,811 in June, 1925. For the twelve months ended June, 1926, the total was 56,912 automobiles against 48,392 for the corresponding period of 1924-25.

Trucks exports in June were 1,562, against 1,617 in May and 1,270 in June, 1925. For the twelve months ended June, 1926, the total was 20,319 compared with 12,706.

Dodge Continues Increases

DETROIT, July 24—For the week ending July 17, Dodge Brothers, Inc., delivered 7460 motor cars and trucks in the United States and Canada, a gain of 209 over the previous week. During the same week a year ago, sales totaled 4767 cars, a gain of 2693 cars.

During the three weeks ending July 17, Dodge Brothers dealers in the United States and Canada have placed 23,862 new cars and trucks in owners' hands.

Spain to Develop Automobile Plants

Special Congress Reports Favorably on Ability to Manufacture Own Vehicles

LONDON, July 20 (by mail)—A special congress set up to inquire into the subject has recommended that the nationalization of a Spanish automobile industry is practicable. It was declared possible to manufacture in the country all the different classes of steel, a factory for producing tin and aluminum bars was in course of construction, and alloys of copper and aluminum were produced. As ball bearings are not yet manufactured it is proposed to allow them to enter duty free until they can be produced in the country. Planting of rubber in the Spanish-West African colonies is to be encouraged to create a tire industry.

The congress has recommended that all factories at present existing and producing, all those at present closed down, and all foreign concerns that become naturalized and manufacture all parts in the country should be considered as national. These firms would receive all State, county council, municipal, and aviation contracts.

It is also recommended that protective measures should be enforced over a period of five years, exempting from customs duties all machinery for the manufacture of motor body work or airplanes, all raw materials not produced in Spain, and all accessories until they are manufactured in Spain. Companies may be formed and capital increased without incurring taxation.

It is expected that the Government will adopt these suggestions at an early date. It is also expected that several foreign manufacturers will avail themselves of the opportunity to become nationalized. For instance, it is said that W. R. Morris was not only present at the congress, but had interviews both with the Marquis de Estella and the king.

Australia Increases Duty on All Chassis Imports

WASHINGTON, July 24—An increase in both the British preferential and general import duties on motor chassis, assembled and unassembled, into Australia was effective on July 9, according to information received by the U. S. Department of Commerce.

The charges are as follows: Motor chassis, sans rubber tires or storage batteries, is increased from the free list to 2½ per cent ad valorem for the British preferential schedule and from 12½ per cent to 15 per cent for the general list. On assembled motor chassis, without rubber tires and storage batteries the old rate for the British preferential was 5 per cent which has been increased to 7½ per cent and the general from 17½ to 20 per cent ad valorem.

Retail Tire Buying Speeds Factory Pace

Smaller Producers Working at Capacity—Car Equipment Business Shows Decline

AKRON, July 26—A check of Akron rubber factories reveals that production of automobile tires has gained from 15 to 20 per cent during the past two weeks. Total output has risen to nearly 120,000 casings a day, compared with 100,000 in June and about 85,000 in May.

Owing to the immense surplus of tires which accumulated during the spring and early summer, the larger factories are still operating on reduced schedules, and production is below what it was at this time last year. The recent price cuts and warmer weather have brought about expected increases in orders from dealers, but original tire equipment business has declined.

As a result the plants of Goodyear, Goodrich and Firestone, which supply the motor car makers with the bulk of their rubber requirements, have not been able so far to increase their production in proportion to their smaller and medium-sized competitors, selling their products direct to dealers. The General, Seiberling, India, Mohawk and other companies, in the latter class, are especially busy, with their plants running at full capacity. Miller does some original equipment business, but officials state their consumer business has been so large that it has been necessary to operate their plant at capacity.

Goodyear, which was the first company to cut prices of tires July 6, appears to have made the largest proportional gain of the American "Big Five." Shipments to dealers both in this country and abroad have been heavy in the past few weeks. Several big contracts have been made recently with independent distributors, who are taking more than 5000 tires a day to be sold under a different brand.

Goodrich Builds 25,000 Daily

Goodrich has speeded up production to nearly 25,000 casings a day, a gain of about 4000 tires over June schedules. Rubber footwear departments at Goodrich also resumed operations this week, after a two weeks' suspension for inventory and to allow vacations for employees. The Firestone plant, as well as Goodrich, is producing its entire capacity of small-size balloon tires to meet the run created on that type tire occasioned by the new policy of the Ford Motor Co. in making balloon tires standard equipment on all cars.

The tire companies have not yet found it necessary to hire large numbers of new men, despite the increased production. Improved labor saving machinery has greatly reduced labor costs.

A general feeling of optimism prevails in the industry as to business in the last six months of the year. As

pointed out by one large manufacturer, midsummer does not present a true picture of the industry. Shipments to dealers were more than 5,000,000 tires less in the first six months of this year than they were in the same period of 1925, sales being retarded by high tire prices, accompanied by a "consumers' strike," unseasonable weather, and a general campaign to conserve rubber products. It is estimated that at the beginning of the year motorists carried 10,000,000 spare tires, and they now have less than 5,000,000. Akron authorities predict that shipments to dealers should exceed 20,000,000 tires in the last half of the year, against less than 15,000,000 shipped in the first six months.

Mason Tire & Rubber Sets New Production Records

KENT, OHIO, July 26—Mason Tire & Rubber Co., reports the textile and tire plant at Kent as well as the tire plant at Bedford running three full shifts a day. The factories have now reached their production capacities of 7000 tires and 7500 tubes daily. All previous production records of output are being broken weekly. The management announces that part of the reason for this unprecedented volume for the company at this time of the year, when business is not usually at peak, is the increasing of retail dealer outlets by 100 per cent in the last eight months and the fact that several sizeable car equipment contracts have been obtained.

Dealer Stocks Decreased

NEW YORK, July 26—The average number of all types of pneumatic casings in the hands of tire dealers on July 1, 1926, was 478 against 609 on April 1 and 614 on July 1, 1925, according to the survey just completed by the National Tire Dealers Association. Tube inventories were also lower, July 1 average being 852 per dealer against 1077 on April 1 and 1069 a year ago.

Reports were received from members in 30 cities with the majority reporting stocking only one line of tires carried. Most of those replying to the questionnaire said that uncertainty of prices retarded sales and reported increased demand for repairing tires. A small majority reported increased sales for the first half of the year of 1926 over the same period of 1925.

Britain to Show Inventions

WASHINGTON, July 27—The second International Exhibition of Inventions will be held in Central Hall, Westminster, London, S. W., Oct. 13-23. The exhibition will be of interest to accessory and automobile manufacturers, the Automotive Division of the U. S. Department of Commerce is advised, as it will afford them an opportunity to "stimulate trade and commerce and to bring together the inventor, manufacturer and financier." Accessory and other exhibitors of inventions on the market will be permitted to sell from their exhibition.

1925 Rubber Imports Show 20.9% Increase

Change to Low Pressure Tires Causes Gain Says Department of Commerce

WASHINGTON, July 29—The change from high-pressure to low-pressure types of tires is largely responsible for the large percentage of rubber consumption used in the manufacture of tires and tire sundries, an increase from 73 to 83 per cent being recorded from 1918 to 1925, according to the annual survey of the rubber industry contained in the Department of Commerce Yearbook for 1925 just made public here.

Crude rubber imports, according to the yearbook, set a new high record of 888,478,000 lb., 20.9 per cent more than in 1924. The value of the 1925 imports was \$429,705,000 as compared to \$174,231,000 in 1924.

"The American industry," continues the yearbook summary, "is entirely dependent on imports for its crude rubber supply. The rate has been extremely rapid on a percentage basis throughout the entire period since 1870. The increase from 1924 to 1925 was over 153,000,000 lb. or more than 20 per cent. This tremendous growth is the direct result of the demand for rubber created by increased use of automobiles. The automobile industry began its rapid expansion in 1910, and for each subsequent year an increasing percentage of the rubber consumed in the United States has been used for tires and tire sundries; from 1918 to 1925 the percentage of rubber consumed for tires rose from 73.5 per cent to 83.9 per cent. The growth in consumption from 1923 to 1925 was in large part due to change from high-pressure to low-pressure types of tires, the latter requiring a larger amount of rubber."

Malaya Increases Buying

WASHINGTON, July 29—The trade in automotive vehicles, parts and accessories in British Malaya has shown rapid progress in consequence of the prosperity of the country accompanying the high prices obtained for rubber and tin, according to the Automotive Division of the Department of Commerce. According to official statistics of British Malaya, 3932 passenger cars valued at \$6,430,557, Straits currency, and 461 commercial cars valued at \$864,754, Straits currency, were imported into that country during the first quarter. Accessories imported during this quarter amounted to \$1,449,198 Straits currency.

Rubber Market Quiet

NEW YORK, July 26—The rubber market continues dull and featureless with the price of crude at around 41 cents. Unless the London market declines in the next few days, further restriction of rubber shipments will not be made as of August 1.

Men of the Industry and What They Are Doing

Bauer to Address Groups in Twelve European Cities

George F. Bauer, manager of the foreign trade department of the National Automobile Chamber of Commerce, is enroute to Europe where he will take part in the fifth International Road Congress to be held at Milan, Italy, in September. Mr. Bauer also will speak on economic aspects of motor transport before automobile men in 12 European countries. Last year Mr. Bauer made a similar trip, speaking on traffic control, highways, motor legislation, transport coordination, automotive financing and other related subjects. Special films have been prepared to illustrate the talks.

Anibal Now Vice-President

B. H. Anibal has been elected vice-president in charge of engineering of the Oakland Motor Car Co. He has been chief engineer of the company since March, 1925, coming there from Peerless Motor Car Co. with whom he had served as chief engineer since 1921. From 1911 to 1921 Mr. Anibal was connected with the engineering department of Cadillac Motor Car Co.

Garner Goes to Factory

C. L. Garner, for the past year sales manager of the Chevrolet Motor Ohio company factory branch has been transferred to a more responsible post at the factory. During his stay in Cleveland, Mr. Garner has made a wide acquaintance throughout the State and achieved a record for Chevrolet dealer organization. He has been in the Chevrolet service for 12 years and has held various positions leading to his present promotion.

Flanigan Moves to Detroit

E. B. Flanigan, consulting automotive engineer specializing in brake designs, has established headquarters at 2673 West Grand Boulevard, Detroit, removing from Wilkes-Barre, Pa. Mr. Flanigan was formerly connected with the Sheldon Axle & Spring Co.

Hathorn With Highway Trailer

E. F. Hathorn has joined the engineering staff of the Highway Trailer Co., Edgerton, Wis. He was formerly with the Campbell Transmission Co. and the Mason Motor Truck Co.

Riddell Succeeds Haslam

W. A. Riddell, Frederick, Md., has succeeded E. H. Haslam as general manager of the Hadfield-Penfield Steel Co. No reason was given for Mr. Haslam's retirement after three years of service.

Spencer in Southwest

John A. Spencer has been appointed southwestern district sales manager for the United States Air Compressor Co. of Cleveland. He will have headquarters in Dallas.

CONTINENTAL NAMES MUSKEGON AIR PORT

Continental Motors Corp. officially inaugurated its air line between Detroit and Muskegon, by conducting dedication ceremonies for the new airport at Muskegon.

Ross W. Judson, president, and W. R. Angell, vice-president, with United States Senator James Couzens and Mayor John W. Smith, of Detroit, flew from Detroit in Continental's new three-motored plane to attend the dedication.

Major Thomas Lanphier, commandant of Selfridge Field led a group of Army flyers.

William B. Stout, of the Stout Metal Airplane division of the Ford Motor Co., with Lieut. V. P. VanZandt as pilot; Henry duPont in his own plane, and Eddie Stinson and W. A. Mara of the Stinson Aircraft Co., with Reed M. Chambers of the Florida Airways Co., also flew to Muskegon.

Mills Sells Interest

David B. Mills, former president and principal stockholder of the Rajah Auto Supply Co., Bloomfield, N. J., manufacturer of spark plugs and terminals, has sold his interest in the company to four of his employees who have assumed the following offices: R. A. Bell, president; W. D. Washburn, treasurer; George Berthold, vice-president and engineer, and E. G. Keeler, secretary.

Davies Takes Dealership

M. F. Davies, former manager of the Studebaker branch at Buenos Aires, on August 1 will take over the Studebaker dealership in Minneapolis, which is his home town and of which he has seen very little during his period of foreign service.

A. B. Cooley Resigns

A. B. Cooley has resigned as manager of the automobile department of Montgomery Ward & Co., a position he had held for many years. He has not announced his future plans.

Racheff Heads Research

Ivan Racheff has been appointed metallurgical engineer for the Racine Radiator Co. He will specialize in research in connection with power unit, industrial truck and heavy-duty radiator manufacturing.

Elmer C. Connolly

NEW BRUNSWICK, N. J., July 26—Elmer E. Connolly, treasurer of the Michelin Tire Co., died Sunday at his summer home, Avon, N. J., after an illness dating from last March. Mr. Connolly also was a director of the Budd-Michelin Wheel Co. of Philadelphia.

Goodyear Pin Association to Give Service Awards

Unusual awards for factory men were announced at the annual meeting of the Service Pin Association of the Goodyear Tire & Rubber Co. Six thousand who have been members of the association five years or more attended. The awards will be known as the Paul W. and Florence B. Litchfield awards.

Workmen who have accomplished exceptional results during the year will be given gold medals and their names inscribed on a bronze honor roll. Other awards will be made as circumstances justify to those conspicuous in the saving of life, prevention of accidents, damage or loss, advancement of better relationship between company and men, and in the development of methods or products.

An award will be given annually to the best all around Boy Scout who is a member of the four troops made up of sons of Goodyear men.

Two of the factory awards will go each year to the best graduate of the production and engineering department flying squadron. Members of this squadron take a three-year factory course, perfecting themselves in every operation of the plant and have three hours of school work weekly at Goodyear University.

Flanagan With Larkin

Richard K. Flanagan has been appointed sales manager of the Larkin Automotive Parts Co. He has spent 15 years in the automotive equipment industry and is one of its most widely known figures.

Herbert C. Moser

CHICAGO, July 24—Herbert C. Moser, general manager of the Chicago Motor Coach Co., died suddenly at the Johns Hopkins Hospital, in Baltimore, July 23. Mr. Moser had been suffering for some time from a throat ailment and had gone to Baltimore the early part of the week for treatment. Heart disease was a contributory cause of his death. Mr. Moser was a pioneer in the transportation and motor coach field. He had been connected with the Fifth Avenue Coach Co. in New York before coming to Chicago four years ago and with the New York Railways Co. before that. He was 44 years old and lived at the Melbourne Hotel.

Albert M. May

CLEVELAND, July 24—Funeral services for Albert M. May, 70 years old, president of the Peerless Automatic Machine Co., who died July 21 in Stamford, Conn., were conducted today. Before organizing his own company, Mr. May had been engaged in the machine tool business for 30 years and was formerly connected with Leek, Doering & Co. He had a big part in the development of the gas engine.

Studebaker Profit \$8,735,861 in Half

SOUTH BEND, July 26—Net profit of \$4,706,940 after depreciation, Federal taxes and all charges, is shown by Studebaker Corp. of America for the quarter ended June 30. This compares with \$4,028,920 in the preceding quarter and with \$6,516,268 in the second quarter of 1925. Net profit for the half year of 1926 totaled \$8,735,861, as against \$10,122,048 in the first six months of 1925.

Net sales of the corporation in the first six months of 1926 were \$75,840,607, as against \$86,569,763 for the 1925 half-year, and \$71,106,226 in the first half of 1924.

The balance sheet as of June 30 shows total assets of \$132,334,756 as against \$132,588,002 on June 30, 1925. Inventories total \$26,575,296 as against \$24,114,044, cash is \$14,551,740 as against \$12,849,480, sight drafts \$1,710,873 as against \$4,627,092, and receivables \$6,729,996 as against \$10,999,837. Surplus is shown as \$37,183,350 as against \$36,293,539.

Pierce-Arrow Shows Income of \$803,843 in First Half

BUFFALO, July 27—Pierce-Arrow Car Co. reports net income of \$474,861 for the quarter ended June 30, after depreciation, Federal taxes and all charges. This compares with \$328,982 in the preceding quarter, and with \$364,714 in the second quarter of 1925. For the first six months of the year net income was \$803,843, comparing with \$502,131 in the first half of 1925.

Philippines Buy Small Cars

WASHINGTON, July 27—The sale of automobiles in the Philippines during June broke all previous records, says a cable to the Department of Commerce from Trade Commissioner Butler at Manila, with competition entirely between various American makes. There

is an increasing demand for small cars and light trucks almost exclusively. Motorcycles are reported not popular, with the sales negligible.

Says Repossessions Few on Non-Recourse Paper

NEW YORK, July 26—Taking issue with the statements that no recourse financing increased repossessions and imposed a burden on the used car market, Hare & Chase, Inc., declares that with its annual volume of business of \$50,000,000, repossessed cars on hand as of July 24 totaled 587, an average of eight for each of the 73 branch offices and of one for every seven dealers of the 4000 served by the company. The largest single accumulation was 52 in New York City.

Steel Treaters to See Many Plant Operations

CLEVELAND, July 28—Included among the plants that will be inspected during the Chicago convention of the American Society for Steel Treating, which will be held the week of Sept. 20, are Buda Co., Wyman-Gordon Co., Miehle Printing Press & Mfg. Co., American Forge Co., International Harvester Co., Youngstown Sheet & Tube Co., Inland Steel Co., Danley Machine Specialties Co., Inc., Pettibone Mulliken Co., Western Electric Co., Interstate Iron & Steel Co., Illinois Steel Co., Columbia Tool Steel Co., American Manganese Steel Co., and A. Finkl & Sons.

Set Paris Aero Show Date

WASHINGTON, July 29—The tenth International Aeronautical Exposition will be held at the Grand Palais, Paris, from Dec. 3 to 19, 1926, under the auspices of the French "Chambre Syndicale des Industries Aeronautiques," according to consular advices just received by the Automotive Division of the Department of Commerce.

Financial Notes

Commercial Investment Trust Corp., for the six months ended June 30, reports net profits of \$1,976,567 available for dividends. This is an increase of \$586,616 over the same period of 1925. After provisions for dividends on the 6½ per cent and 7 per cent preferred stocks, the balance indicated an annual rate of \$6.94 officials announced. Gross business volume during the half was \$111,049,752, against \$69,800,404 during the initial half of last year.

United States Rubber Co. earnings in the first six months of the year are indicated as approximating \$4,000,000, which will compare with earnings of \$5,875,204 in the first half of 1925. Earnings do not include a reported profit of about \$3,000,000 in the first half of 1926 by the General Rubber Co., a subsidiary, which operates the plantation properties in the Far East.

Radio Corp. of America reports net profits of \$82,020 for the quarter ended June 30, after all charges. This compares with net of \$1,788,510 in the preceding quarter, and with a deficit of \$391,053 in the second quarter of 1925. For the six months to June 30 net profits were \$1,870,531 comparing with \$1,537,276 in the 1925 first half.

C. G. Spring & Bumper Co. will pay a total dividend, this quarter, of 15 cents. The regular dividend on common stock of 10 cents quarterly plus an extra dividend of five cents has been declared payable Aug. 16 to stockholders of record, Aug. 7.

Allis-Chalmers Mfg. Co. net income for the five months ended May 31, 1926, was \$1,364,164, equal to \$8.27 per share on 165,000 shares of preferred stock and \$3.43 on 257,707 common shares.

India Tire & Rubber Co. has had admitted 125,000 authorized shares of no par common stock to unlisted trading privileges by the New York Curb Market.

Developments of the Week in Leading Motor Stocks

NEW YORK, July 29—Record high levels and a heavy volume of trading in General Motors were again the outstanding features of a week in which professional buying and selling dominated the price movement in the stock market.

It is not unusual that the motor stocks, in general, and General Motors in particular have focused financial attention to the striking prosperity and the unusually high earning power of the automobile industry which accomplishes its miracles by selling its goods not at inflated prices but at the lowest prices in history. While other companies have not made the same sweeping gains as General Motors, several reports issued recently show that profits continue at a level which compares favorably with last year's results.

Studebaker Corp. issued its report for the second quarter showing profits larger

than were realized during the first three months of the year, although sales were slightly less. For the first six months this company's profits were slightly lower than for the first six months last year, but they were equal to over 80 per cent of the full year's dividend.

Chrysler is the only large producer which has not yet reported on the six months' operations but estimates in banking circles expect earnings to exceed last year's showing by around \$2,000,000, with a balance of approximately \$3 a share on the common equal to the full year's dividend.

While General Motors was enjoying its advance, the rest of the motor group was reactionary and many issues during the week were slightly lower than in the preceding week. Hudson lost some of the 10 point advance that was engineered against the short interest and Dodge

eased off several points from the high on the current move. The latter appeared to find good buying support around 33 from the pool which has been formed.

The accessory stocks were inactive, but held firm around former levels. Good buying was reported under way in Eaton Axle & Spring and Timken Roller Bearing. Both companies are making a good showing in earnings this year. While the leading rubber stocks, U. S. Rubber and Goodrich were comparatively inactive with minor fluctuations in prices, the pool which has been working in Intercontinental Rubber, a comparatively recent arrival on the Exchange, got busy and advanced quotations several points on heavy turnover. Intercontinental is the principal producer of rubber from the guayule shrub and high prices for the plantation product has also stimulated its market.—E. S.

Insurance Proposal Meets A.A.A. Protest

Cites Five Major Reasons Why
Compulsory Protection
Would be Undesirable

WASHINGTON, July 28—Opposition to compulsory automobile insurance, legislation for which is pending in several State legislatures and Congress, was voiced here this week by the American Automobile Association. The Association announces its stand on the subject after an investigation extending over several years it declares.

Five major reasons are assigned why compulsory insurance is not desirable, viz.: (1) It would cost the motorist \$300,000,000 annually to provide protection against a comparatively few motorists who are financially irresponsible; (2) would increase insurance rates; (3) would breed recklessness rather than promote greater care; (4) would degenerate into State insurance and be an entering wedge for State control of every other business, and (5) would not prove a safety factor as "there is no relation between prevention of accidents and compensation for accidents."

The association announces its intention of carrying on an active campaign against compulsory legislation in every legislature where bills are introduced and in Congress.

Ohio to Light Highways as Aid to Night Driving

COLUMBUS, July 26—If the plans of W. A. Alsdorf, secretary of the Ohio Good Roads Federation, are carried out, sections on each of two important highways in central Ohio will soon be equipped with electric lights for night illumination in the interest of safety for night driving. Mr. Alsdorf has secured the cooperation of the Ohio Highway Department and electric light companies and the standards soon will be installed. The two sections are located on the National Road, east of Columbus and on the Marysville-Columbus road southeast of Marysville. This is the first serious attempt in Ohio to provide illumination of highways although the experiment has been tried in a small way in several eastern states. The experiment will be watched with great interest.

Highways Grow 10,628 Miles

WASHINGTON, July 28—A total of 10,628 miles of Federal-Aid highway were completed in the United States during the fiscal year ending July 1, it is announced by the Bureau of Public Roads of the Department of Agriculture. The total cost was \$226,552,043, of which \$100,524,357 was paid by the Federal Government.

Since 1917, when the Federal-Aid law became effective, a total of over 52,000 miles of highway has been completed.

RAILWAY REVENUES HELD LOW BY CARS

WASHINGTON, July 26—Attributed primarily to the increased use of automobiles, there was but a slight gain in the first four months of this year, over similar period last year, of railway passenger revenues, according to the Interstate Commerce Commission's monthly statement of railway traffic statistics.

Total passenger revenue for the period was \$324,321,101, compared with \$324,105,923 in the first four months of 1925. The number of revenue passengers carried was 286,984,000 as compared with 295,980,000. Passengers carried one mile aggregated 10,794,834,000, while the average revenue per passenger mile was 3.051 cents.

Indiana Rail Line Would Drop Buses

INDIANAPOLIS, July 23—The Indiana bus cycle is drawing near to completion. At first there was independent operation. Then the traction companies entered the field, in some cases buying out independent bus operators. Then a public service commission rule was voted by the Indiana legislature, which permitted the commission to pile up bus operations costs. Now, with practically no independent bus operation in Central Indiana, one prominent company leads the way in asking cancellation of its "permits to operate buses on certain lines."

The Interstate Public Service Co., one of the strongest traction and electric and other utility owners in the State, asked permission to cease operating its lines from Indianapolis through to Louisville. Parts of this line will be retained, but permission is requested to cease operation between Seymour and the Indiana-Kentucky state line. It is claimed that the company lost \$10,494 during the first six months of this year over the Indianapolis, Sellersburg, New Albany line. On the route between Seymour and Indianapolis the company claims to have carried only 49 passengers with revenues of \$43 during the first ten days of July. The company points out that it gives electric traction service in the territory in which it hopes to abandon its bus lines. Parts of the bus lines were at one time owned and operated by independents.

Farm Population 30,655,000

WASHINGTON, July 24—The Department of Agriculture reports a continued decrease in farm population of the United States, estimating that there were 479,000 fewer people on farms on January 1, 1926, than there were on January 1, 1925. The January, 1926, farm population is estimated at 30,655,000, compared with 31,134,000 in 1925.

Uniform Traffic Law Sought in California

State, County and Municipal
Officers Form Association
to Pursue Adoption

SAN FRANCISCO, July 26—Codification of uniform traffic laws throughout California, with the future plan of working for similar nation-wide uniformity of these statutes, was the keynote of the All-State Traffic Conference here. The meeting, which was attended by representatives of all boards of supervisors in central and northern California, members of automotive trade organizations, and civic bodies, was called to order by Supervisor Charles F. Todd, of San Francisco, chairman of the traffic committee of the board of supervisors of this city. Mr. Todd was named permanent chairman and W. J. Locke, city attorney of Alameda, permanent president.

The California State Automobile Association, through G. E. Sandford, presented the draft of a proposed traffic code. This, he said, had been compiled after a conference with Dr. Miller McClintock, traffic consultant of San Francisco, Los Angeles and Chicago. The success of southern California cities in adopting and using a uniform traffic code was described by J. Allen Davis, attorney for the Automobile Club of Los Angeles, who said that it had brought uniform commendation from motorists, police departments, traffic officials and automotive trade organizations.

Every speaker emphasized the statement that the proper control of automobile traffic is contingent upon joint control of automotive vehicles and pedestrians. Parking methods, time limits, use of hand signals, fines and the "scrip" system of fining, traffic courts, and "mechanical policemen" were among the subjects also discussed. J. C. Dunham, chairman of the Board of Commissioners of Washoe County, Nev., reported that as soon as California devised and adopted a uniform code, it was the intention of the Nevada authorities to put the same code into immediate use.

Permanent Committee Named

A committee on permanent organization was named by Chairman Todd. Out of the first day's proceedings grew the organization of the California Municipal Traffic League, with all public officials of the State, counties and municipalities of California whose duties relate to the making or enforcement of traffic regulations, eligible to membership. Automobile clubs, safety councils, highway associations and other organizations interested in traffic regulation may be admitted. Private manufacturers of traffic controlling devices are barred from membership. The model ordinance presented by the C. S. A. A. was unanimously recommended for adoption by all cities in the State.

Mexican Shipments Gain in First Half

Total Value of Exports Will
Exceed Former Years—
Floods Cause Loss

LAREDO, TEXAS, July 24—For the first six months of this year a total of 719 cars of automobiles were exported to Mexico through this port of entry. Each car averaged six automobiles, making a total of 4314 automobiles for the half year period. The total number of cars of automobiles shipped into Mexico during the first six months of 1924 was 267, and during the first six months of 1925 it was 612. The exports through here for the last six months of 1925 were 1366 cars, or approximately 8196 automobiles. It is expected that this record will be exceeded in the last six months of this year, and that the total for the year will be around 15,000 automobiles. In addition to the shipments through Laredo many automobiles are exported to Mexico through the port of Tampico, and a considerable number through the border ports of entry of Brownsville, Eagle Pass, El Paso and Nogales.

The best trade months not only in the matter of automobiles but of various other American goods and commodities are September, October, November and December. It is expected that the total value of exports through Laredo for the current year will be in excess of \$40,000,000, as compared with \$35,000,000 for last year. The value of exportations through here for the six months ending June 30, was \$19,478,586.

The recent widespread floods in Mexico have caused great damage to crops and property generally and the disaster is causing temporary depression of business in that country, according to reports received here. It is expected, however, that this unfavorable condition will pass away soon, as there is yet ample time for replanting corn and beans in the flooded districts, and with an abundance of moisture in the ground good crops may yet be grown.

Southern Truck Business Setting New High Records

ATLANTA, July 27—With definite records now available regarding motor truck sales in the Southeast during the first six months of this year by two of the largest southern distributors—the Mack International Motor Truck Corp., and the White Motor Co.—there is excellent promise of a record truck year in the South for 1926 if the ratio of sales of the first six months is maintained during the last six months of the year.

From January to June inclusive the truck sales of both these companies established one of the largest records in the history of the South for this period, entering July with the prospects highly satisfactory for continued active call

during the remainder of the year. In some instances, in fact, the southern branches of these two companies sold during the first six months of the year as many motor trucks as were sold during the whole of 1925, the average gain over sales for the same period last year being around 25 to 30 per cent. Though substantial sales are being made for delivery purposes, the industrial call for trucks has shown the largest gain.

U.P.C. Elects New Officers at Meeting

NEW YORK, July 26—The United Publishers Corp., the holding company which controls the Chilton Class Journal Co., the Iron Age, the Economist Group and other business publishing enterprises, held its annual stockholders meeting July 20, when Charles G. Phillips, president of the corporation, announced his retirement from active business. Following this announcement a reorganization of the officers was put into effect, by which the presidents of the four principal subsidiary companies of the U. P. C. became the chief executive officers of the corporation.

Andrew C. Pearson, president of the Economist Group, was elected chairman of the board of directors; F. J. Frank, president of the Iron Age Publishing Co., was elected president of the U. P. C.; C. A. Musselman, president of the Chilton Class Journal Co., was elected vice-president; F. C. Stevens, president of the Federal Printing Co., was elected treasurer and H. J. Redfield was re-elected secretary.

Common Carrier Control Not Affected by Decision

SAN FRANCISCO, July 24—To correct possible misunderstanding as to the effect of the recent decision of the United States Supreme Court on the constitutionality of the California Auto Stage and Truck Transportation Act of 1917, Arthur H. Samish, secretary-manager of the Motor Carriers' Association of California, has pointed out that the court's decision in the Frost & Frost case does not affect the constitutionality of that act as a whole, but merely the constitutionality of an amendment to the act passed by the 1919 Legislature, two years after the original enactment.

The amendment, now held unconstitutional, required contract freight carriers to apply to the state Railroad Commission for certificates as common carriers.

New Fageol Trucks Out

OAKLAND, CAL., July 24—New three, four and six-ton truck models with Waukesha six-cylinder engines and seven-speed transmissions have been introduced by the Fageol Motors Co. It is stated that these new jobs in no way supplant other heavy duty Fageol trucks with Hall-Scott engines but have been added to the line to provide a Fageol truck for every trucking purpose.

James Co. Takes Over Gas Engine Valve Co.

Company Will Bring Out New
Valve With Hollow Head
Construction

DETROIT, July 26—The James Motor Valve Co. has absorbed the Gas Engine Valve Co.

Following announcement of the merger, the James Company made known that it is bringing out a new valve, declared to be immune to heat, warping, burning or pitting because of its unique hollow-head construction. It will be known to the trade as the James Self-Cooling Valve.

The new valve was developed by George D. Grant, who retired as president and general manager of the Grant Motor Co., three years ago to devote his time to it. As a result of the merger, Mr. Grant, who was head of Gas Engine Valve Co., and M. C. Dewitt, vice-president of the Champion Spark Plug Co., will be added to the board. Other officers are: John H. James, president; H. E. Butcher, vice-president; T. R. Walton, secretary and treasurer; H. Temple Barbour and Walter F. Haas. Carlyle H. Long, engineer of the Gas Engine Valve joins Mr. Grant in the James organization as sales manager.

35 Financing Companies Organize in Milwaukee

MILWAUKEE, July 24—Representatives of thirty-five finance companies specializing in automotive paper in Wisconsin met in Milwaukee to perfect an organization, the principal object of which will be to standardize rules and rates, exchange credit information, and provide mutual protection against buyers who forget or refuse to maintain instalment payments according to contract specifications.

A second meeting will be held in Wisconsin Rapids about August 10, when the organization committee will be ready to report. Laurence M. Jeger of Milwaukee is serving as temporary chairman, and E. W. Genens, Milwaukee, temporary secretary, they serving as an organization committee with C. H. Lohr, Hartford; G. W. Witte, Sheboygan; W. F. Anderson, Wisconsin Rapids, and W. M. Culp, Milwaukee. The movement is considered one of the most significant that has taken place in automobile financing since the present vogue of credit sales plans was inaugurated.

Meet Canadian Duty Change

WASHINGTON, July 24—Notices are being sent out by the Treasury Department to collectors of customs revising countervailing duties on automobiles and motorcycles from Canada to correspond with the recently amended Canadian tariff laws in which duties were changed on automobiles, motorcycles and parts imported into the United States.

Find Rural Traffic Requires Attention

NEW YORK, July 25—Rural motor fatalities increased 23 per cent in 1925 against an estimated increase of 10 per cent for the country as a whole, according to a survey just completed by the National Automobile Chamber of Commerce, which sees the need for focusing attention on the betterment of traffic in the country districts.

Figures on rural fatalities this year are not available, but so far in the cities there has been a slight decrease from the same period last year, although May, 1926, was over May, 1925. On the whole there is a possibility that the tide in motor accidents, rising over a long period of years, has at last turned.

Ohio Gasoline Tax Yields \$12,667,504 for Road Work

COLUMBUS, July 24—The two cent gasoline tax in Ohio produced \$12,667,504, during the fiscal year ending June 30. Of that amount \$6,276,466 was returned to counties and municipalities for road maintenance and the remainder, amounting to \$5,600,401 was transferred to the maintenance and repair fund for the maintenance and repair of State highways. The State Highway building fund at the close of the fiscal year was \$1,454,032 as compared with \$2,431,603 at the beginning of the fiscal year.

The balance in the maintenance and repair fund at the close of the fiscal year was \$4,479,467, disbursements being \$10,858,909 and credits to the fund, \$11,120,968. Of the credits to this fund, \$5,112,760 was derived from the sale of license tags, \$116,344 from motor bus fees and \$5,600,401 from the gasoline tax.

Coming Feature Issue of Chilton Class Journal Publication

Sept. 30—Automotive Industries
Annual Production Issue

American Car Industry's Part of World Trade .82%

WASHINGTON, July 26—The relation of the automobile industry's exports to the total of the United States and for the world, is shown by figures just compiled by the Department of Commerce, showing that America's share of the world trade is roughly 15.6 per cent of the total and that of this sum the automobile industry's export share in 1925 was .817 per cent.

Expressed in terms of figures, the Department's compilation shows that the aggregate export business of the 55 leading countries was \$58,500,000,000 in 1925, the United States exports being \$4,910,000,000, of which approximately \$400,000,000 were automobile exports.

817 in 100,000 Mile-Club

SOUTH BEND, July 13—There are now 817 cars on the 100,000 mile-club roster of the Studebaker Corp. of America according to revised listings. The company organized the club in March with 274 charter members.

Wisconsin Gets \$13,782,245 Fees

MILWAUKEE, July 24—Wisconsin motorists paid a tribute of \$13,782,245 into the State treasury during the fiscal year ended June 30, the State's revenue from motor licenses being \$8,922,090, and from the 2 cent gasoline tax \$5,025,953.

Milan Road Congress to Hear U. S. Views

MILAN, July 17 (by mail)—At the Fifth International Road Congress which opens here Sept. 6, the United States will be represented by speakers on each of the six questions making up the agenda. In the discussion of the first question—construction and upkeep of concrete roads—nine Americans, including J. Shirley Bright of the U. S. Bureau of Public Roads and a number of State highway officials, will take part.

Nine representatives will participate in the discussion on asphalt roads. On acceptance tests for materials Albert T. Goldbeck, Chief Division of Tests, Bureau of Public Roads, and five others will present the views and practices of the United States. Henry R. Trumbower and Lawrence I. Hewes, both of the Bureau of Public Roads, and seven other engineers are scheduled to speak on census of circulation.

The American viewpoint on the development of towns in the interest of traffic will be presented by ten engineers and city planning experts while Thomas D. MacDonald, Chief of the Bureau of Roads will enter the discussion of roads reserved especially for motor cars.

Connecticut Receipts Gain

HARTFORD, CONN., July 24—Receipts of the State motor vehicle department for the fiscal year ending June 30, exclusive of the gasoline tax, totaled \$6,162,179; a 10 per cent increase over the previous fiscal year. Of the total for the year just closed \$4,771,069 was derived from registration fees. The second largest item was \$880,455 receipts from the licensing of 290,792 drivers. This covers all classes and shows an increase of 26,925 operators.

Calendar of Coming Events

SHOWS

Batavia, Java July 31-Aug. 6
Exhibition, Botanical and Zoological
Garden at Weltevreden.
Boston, Mass. Sept. 27-Oct. 2
Radio Exposition, Mechanics' Bldg.
Brussels Dec.
Buenos Aires Dec. 7-20
Ninth Argentine Automobile Show,
Palermo Park.
Chicago Sept. 20-24
National Steel and Mechanical Tool
Exposition, Municipal Pier, American
Society for Steel Treating.
Chicago Sept. 27-Oct. 2
National Radio Exposition.
Chicago Nov. 8-13
Coliseum, Automotive Equipment As-
sociation.
Chicago Nov. 15-19
Hotel Sherman, National Standard
Parts Association.
Chicago Jan. 29-Feb. 5
National, Coliseum, National Auto-
mobile Chamber of Commerce.
Cleveland Oct. 4-8
Public Auditorium and Annex, Amer-
ican Electric Railway Association.
London Oct. 4-9
Olympia Motor Cycle.

London Oct. 21-30
Milan Sept. 1-20
Exposition.
Milan Sept. 6-13
Fifth International Road Congress.
New Haven Sept. 7-10
Machine Tool Exhibition.
New York Sept. 13-18
Radio World's Fair, Madison Square
Garden.
New York Jan. 8-15
National, Grand Central Palace, Na-
tional Automobile Chamber of Com-
merce.
Paris Oct. 7-17
Auto Salon, Grand Palais.
Paris Dec. 3-19
International Aeronautic Exposition,
Grand Palais.
Prague Sept.
San Francisco Aug. 21-28
Pacific Radio Exposition, Exposition
Auditorium.

CONVENTIONS

American Electric Railway Association,
Public Auditorium and Annex, Cleve-
land Oct. 4-8
American Society for Steel Treating,
Municipal Pier, Chicago Sept. 20-24

Associated Manufacturers of Fabric
Auto Equipment, Inc., La Salle
Hotel, Chicago Nov. 13
Automotive Equipment Association, Colli-
seum, Chicago Nov. 8-13
National Standard Parts Association,
Hotel Sherman, Chicago Nov. 15-19
National Tire Dealers Association, Inc.,
Memphis, Tenn. Nov. 16-18

S. A. E. MEETINGS National

Boston, Nov. 16-18, National Transportation
and Service.
Chicago, Sept. 21-23, Production Engineer-
ing, Hotel Sherman.
Philadelphia, Sept. 2-3, Aeronautical.

RACES

Altoona Sept. 6
Atlantic City Sept. 25
Charlotte, N. C. Aug. 23
Dallas, Texas Nov. 11
Laurel, Md. Oct. 23
Los Angeles Nov. 25
Philadelphia Sept. 4-11
National Air Races.
Salem, N. H. Oct. 12